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of the

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Route to:

1790 ***Celebrating 200 Years of Creativity*** 1990

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Patent and Trademark Office

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Apr. 30, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on July 21, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,680,812 through 4,682,370
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on July 19, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,393,519 through 4,394,780
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force

beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MAY 13, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,328,617	06/262,644	5/11/82
4,328,631	06/222,931	5/11/82
4,328,664	06/228,736	5/11/82
4,328,676	06/247,623	5/11/82
4,328,683	06/224,146	5/11/82
4,328,748	06/228,877	5/11/82
4,328,765	06/257,907	5/11/82
4,328,788	06/241,886	5/11/82
4,328,904	06/231,172	5/11/82
4,328,905	06/237,856	5/11/82
4,328,914	06/220,418	5/11/82
4,328,949	06/230,836	5/11/82
4,329,035	06/221,404	5/11/82
4,329,115	06/230,203	5/11/82
4,329,148	06/222,926	5/11/82
4,329,161	06/264,870	5/11/82
4,329,171	06/223,365	5/11/82
4,329,185	06/226,757	5/11/82
4,329,202	06/235,764	5/11/82
4,329,208	06/225,542	5/11/82
4,329,211	06/244,712	5/11/82
4,329,269	06/225,516	5/11/82
4,329,288	06/220,945	5/11/82
4,329,343	06/228,053	5/11/82
4,329,357	06/232,494	5/11/82
4,329,360	06/250,806	5/11/82
4,329,373	06/268,112	5/11/82
4,329,450	06/238,262	5/11/82
4,329,455	06/224,968	5/11/82
4,329,472	06/253,346	5/11/82
4,329,534	06/234,298	5/11/82
4,329,647	06/270,383	5/11/82
4,329,698	06/218,145	5/11/82
4,587,673	06/728,040	5/13/86
4,587,675	06/546,873	5/13/86
4,587,676	06/568,803	5/13/86
4,587,679	06/678,458	5/13/86
4,587,681	06/733,884	5/13/86
4,587,683	06/717,596	5/13/86
4,587,684	06/541,925	5/13/86
4,587,693	06/775,775	5/13/86
4,587,696	06/552,694	5/13/86
4,587,697	06/622,942	5/13/86
4,587,700	06/618,619	5/13/86
4,587,706	06/706,148	5/13/86
4,587,719	06/617,304	5/13/86
4,587,726	06/644,774	5/13/86
4,587,733	06/654,001	5/13/86
4,587,737	06/637,067	5/13/86
4,587,740	06/736,727	5/13/86
4,587,749	06/675,813	5/13/86
4,587,750	06/690,307	5/13/86
4,587,753	06/590,508	5/13/86
4,587,760	06/754,155	5/13/86
4,587,763	06/744,132	5/13/86
4,587,767	06/304,079	5/13/86
4,587,769	06/736,606	5/13/86
4,587,770	06/616,561	5/13/86
4,587,773	06/722,409	5/13/86
4,587,775	06/631,872	5/13/86
4,587,778	06/658,352	5/13/86
4,587,783	06/641,271	5/13/86
4,587,787	06/540,052	5/13/86
4,587,791	06/685,526	5/13/86
4,587,793	06/692,653	5/13/86
4,587,799	06/612,520	5/13/86
4,587,800	06/702,902	5/13/86
4,587,810	06/634,833	5/13/86
4,587,818	06/472,950	5/13/86
4,587,830	06/755,601	5/13/86
4,587,831	06/736,289	5/13/86
4,587,837	06/692,123	5/13/86
4,587,838	06/610,816	5/13/86
4,587,845	06/661,220	5/13/86
4,587,851	06/705,570	5/13/86
4,587,852	06/622,644	5/13/86
4,587,858	06/695,620	5/13/86
4,587,870	06/669,816	5/13/86
4,587,872	06/721,944	5/13/86
4,587,874	06/572,119	5/13/86
4,587,876	06/653,224	5/13/86
4,587,877	06/673,326	5/13/86
4,587,894	06/702,450	5/13/86
4,587,903	06/559,092	5/13/86
4,587,904	06/689,429	5/13/86
4,587,905	06/555,150	5/13/86
4,587,909	06/657,917	5/13/86
4,587,910	06/646,810	5/13/86
4,587,916	06/663,209	5/13/86

Patent Number	Serial Number	Issue Date
4,587,917	06/619,577	5/13/86
4,587,920	06/621,241	5/13/86
4,587,924	06/724,355	5/13/86
4,587,931	06/680,279	5/13/86
4,587,934	06/495,073	5/13/86
4,587,949	06/607,569	5/13/86
4,587,950	06/687,614	5/13/86
4,587,952	06/733,275	5/13/86
4,587,957	06/422,306	5/13/86
4,587,999	06/719,063	5/13/86
4,587,960	06/502,707	5/13/86
4,587,961	06/579,798	5/13/86
4,587,962	06/578,230	5/13/86
4,587,963	06/613,030	5/13/86
4,587,969	06/695,791	5/13/86
4,587,971	06/676,461	5/13/86
4,587,979	06/612,148	5/13/86
4,587,981	06/742,326	5/13/86
4,587,982	06/449,771	5/13/86
4,587,986	06/702,121	5/13/86
4,587,987	06/645,531	5/13/86
4,587,988	06/649,511	5/13/86
4,587,994	06/775,225	5/13/86
4,588,007	06/538,915	5/13/86
4,588,017	06/614,677	5/13/86
4,588,033	06/647,173	5/13/86
4,588,042	06/633,654	5/13/86
4,588,044	06/637,135	5/13/86
4,588,048	06/590,988	5/13/86
4,588,051	06/560,649	5/13/86
4,588,056	06/600,836	5/13/86
4,588,082	06/713,551	5/13/86
4,588,083	06/455,255	5/13/86
4,588,085	06/710,439	5/13/86
4,588,088	06/457,056	5/13/86
4,588,089	06/651,523	5/13/86
4,588,097	06/718,874	5/13/86
4,588,101	06/659,544	5/13/86
4,588,107	06/501,937	5/13/86
4,588,109	06/705,086	5/13/86
4,588,115	06/710,106	5/13/86
4,588,116	06/653,169	5/13/86
4,588,120	06/461,449	5/13/86
4,588,136	06/673,626	5/13/86
4,588,137	06/584,325	5/13/86
4,588,138	06/626,371	5/13/86
4,588,148	06/616,904	5/13/86
4,588,152	06/590,306	5/13/86
4,588,165	06/684,373	5/13/86
4,588,166	06/577,019	5/13/86
4,588,178	06/745,436	5/13/86
4,588,186	06/624,470	5/13/86
4,588,187	06/625,102	5/13/86
4,588,193	06/641,864	5/13/86
4,588,194	06/697,725	5/13/86
4,588,196	06/613,258	5/13/86
4,588,203	06/658,583	5/13/86
4,588,205	06/653,002	5/13/86
4,588,208	06/608,450	5/13/86
4,588,210	06/599,099	5/13/86
4,588,222	06/640,629	5/13/86
4,588,223	06/681,098	5/13/86
4,588,224	06/609,811	5/13/86
4,588,227	06/625,706	5/13/86
4,588,232	06/648,906	5/13/86
4,588,234	06/709,881	5/13/86
4,588,241	06/535,244	5/13/86
4,588,250	06/538,621	5/13/86
4,588,252	06/221,531	5/13/86
4,588,285	06/622,489	5/13/86
4,588,286	06/712,406	5/13/86
4,588,291	06/671,008	5/13/86
4,588,299	06/655,935	5/13/86
4,588,300	06/614,994	5/13/86
4,588,310	06/620,104	5/13/86
4,588,317	06/657,898	5/13/86
4,588,318	06/759,510	5/13/86
4,588,323	06/572,576	5/13/86
4,588,335	06/650,469	5/13/86
4,588,340	06/505,311	5/13/86
4,588,345	06/696,090	5/13/86
4,588,347	06/421,547	5/13/86
4,588,357	06/633,932	5/13/86
4,588,363	06/713,358	5/13/86
4,588,372	06/421,926	5/13/86
4,588,375	06/605,056	5/13/86
4,588,377	06/694,596	5/13/86
4,588,379	06/576,299	5/13/86
4,588,387	06/583,633	5/13/86
4,588,388	06/629,750	5/13/86
4,588,396	06/528,048	5/13/86
4,588,410	06/517,524	5/13/86
4,588,433	06/582,121	5/13/86
4,588,455	06/641,715	5/13/86
4,588,462	06/706,967	5/13/86
4,588,475	06/652,818	5/13/86
4,588,479	06/710,031	5/13/86
4,588,489	06/502,058	5/13/86
4,588,505	06/608,028	5/13/86
4,588,507	06/568,741	5/13/86
4,588,521	06/609,345	5/13/86
4,588,522	06/484,528	5/13/86
4,588,529	06/706,586	5/13/86
4,588,551	06/678,467	5/13/86
4,588,555	06/432,506	5/13/86
4,588,560	06/626,559	5/13/86
4,588,562	06/631,443	5/13/86
4,588,565	06/636,765	5/13/86
4,588,567	06/695,634	5/13/86
4,588,568	06/582,928	5/13/86
4,588,571	06/601,804	5/13/86
4,588,600	06/486,254	5/13/86
4,588,605	06/589,346	5/13/86
4,588,614	06/627,482	5/13/86
4,588,618	06/652,622	5/13/86
4,588,619	06/644,854	5/13/86
4,588,621	06/673,760	5/13/86
4,588,622	06/744,103	5/13/86
4,588,640	06/628,709	5/13/86
4,588,657	06/667,159	5/13/86
4,588,658	06/672,079	5/13/86
4,588,663	06/653,703	5/13/86
4,588,669	06/608,457	5/13/86
4,588,674	06/541,734	5/13/86
4,588,690	06/642,628	5/13/86
4,588,698	06/435,528	5/13/86
4,588,715	06/616,720	5/13/86
4,588,719	06/664,222	5/13/86
4,588,723	06/634,851	5/13/86
4,588,734	06/672,645	5/13/86
4,588,735	06/470,824	5/13/86
4,588,736	06/612,340	5/13/86
4,588,737	06/684,214	5/13/86
4,588,738	06/616,145	5/13/86
4,588,744	06/228,987	5/13/86
4,588,748	06/654,068	5/13/86
4,588,749	06/606,597	5/13/86
4,588,757	06/700,536	5/13/86
4,588,758	06/711,520	5/13/86
4,588,791	06/648,221	5/13/86
4,588,792	06/690,791	5/13/86
4,588,797	06/668,223	5/13/86
4,588,812	06/615,201	5/13/86
4,588,817	06/616,640	5/13/86
4,588,821	06/621,013	5/13/86
4,588,822	06/482,409	5/13/86
4,588,831	06/669,965	5/13/86
4,588,833	06/665,226	5/13/86
4,588,848	06/667,047	5/13/86
4,588,853	06/622,776	5/13/86
4,588,866	06/438,472	5/13/86
4,588,874	06/666,176	5/13/86
4,588,878	06/672,214	5/13/86
4,588,880	06/529,613	5/13/86
4,588,898	06/498,220	5/13/86
4,588,906	06/603,541	5/13/86

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4,588,914	06/617,455	5/13/86
4,588,919	06/597,977	5/13/86
4,588,921	06/672,154	5/13/86
4,588,960	06/637,630	5/13/86
4,588,975	06/510,082	5/13/86
4,588,976	06/673,168	5/13/86
4,588,992	06/438,244	5/13/86
4,588,993	06/496,275	5/13/86
4,588,998	06/634,543	5/13/86
4,589,009	06/659,044	5/13/86
4,589,017	06/363,473	5/13/86
4,589,024	06/409,628	5/13/86
4,589,030	06/516,466	5/13/86
4,589,043	06/413,546	5/13/86
4,589,055	06/697,286	5/13/86
4,589,073	06/491,294	5/13/86
4,589,077	06/517,590	5/13/86
4,589,078	06/498,773	5/13/86
4,589,085	06/488,824	5/13/86
4,589,086	06/413,213	5/13/86
4,589,089	06/275,131	5/13/86
4,589,101	06/687,021	5/13/86
4,589,104	06/689,779	5/13/86
4,589,108	06/607,118	5/13/86
4,589,116	06/633,598	5/13/86
4,589,124	06/611,992	5/13/86
4,589,136	06/684,025	5/13/86

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C 41(c); 37CFR 1.378)

The patent (s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,519,069	06/437,165	5/21/85	10/27/82	6/18/90
4,540,022	06/383,550	9/10/85	6/01/82	6/20/90
4,548,413	06/577,157	10/22/85	2/06/84	6/22/90
4,550,276	06/388,230	10/29/85	6/14/82	6/20/90
4,552,928	06/651,059	11/12/85	9/17/84	6/20/90
4,575,002	06/602,909	5/11/86	4/23/84	6/22/90

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,500,032, Re. S. N. 07/532,633, Filed June 4, 1990, Cl. 228/180A, METHOD AND APPARATUS FOR PROPER REGISTRATION OF MATING PARTS, Daniel W. Ackerman, Owner of Record: *Universal Instruments Corp., Binghamton, N. Y.*, Attorney or Agent: Franklin D. Wolffe., Ex. Gp.: 325

4,744,634, Re. S. N. 07/534,624, Filed May 15, 1990, Cl. 350/163, METHOD AND APPARATUS FOR REDUCING THE EFFECTS OF VIBRATIONAL DISTURBANCES OF THE FREQUENCY STABILITY OF A LASER, David Fink., Owner of Record: *Hughes Aircraft Co., Los Angeles, Calif.*, Attorney or Agent: William J. Streeter, Ex. Gp.: 257

4,744,764, Re. S. N. 07/525,875, Filed May 17, 1990, Cl. 439/62, CONNECTOR ARRANGEMENT, Leon Rubinstein, Owner of Record: *Rogers Corp., Rogers, Conn.*, Attorney or Agent: John N. Williams, Ex. Gp.: 322

4,746,067, Re. S. N. 07/527,957, Filed May 24, 1990, Cl. 239/338, LIQUID ATOMIQING DEVICE AND METHOD, Steven A. Svoboda, Owner of Record: *Inventor*, Attorney or Agent: Jerry W. Berkstresser, Ex. Gp.: 314

4,747,907, Re. S. N. 07/530,718, Filed May 30, 1990, Cl. 156/642, METAL ETCHING PROCESS WITH ETCH RATE ENHANCEMENT, John Acocella, Owner of Record: *IBM Corp., Hopewell Junction, N. Y.*, Attorney or Agent: Ira D. Blecker, Ex. Gp.: 134

4,748,411, Re. S. N. 07/530,341, Filed May 30, 1990, Cl. 324/309, PHASE ENCODING TECHNIQUE FOR MORE RAPID MAGNETIC RESONANCE IMAGING, G. Neil Holland, Owner of Record: *Picker International, Inc., Highland Hts., Ohio*, Attorney or Agent: Thomas E. Kocovsky, Ex. Gp.: 265

4,751,387, Re. S. N. 07/533,445, Filed June 5, 1990, Cl. 250/331, INFRARED IMAGING SYSTEM AND METHOD, Jean J. A. Robillard, Owner of Record: *Richard L. Scully, Charlottesville, Va.*, Attorney or Agent: James M. Slattery, Ex. Gp.: 256

4,783,127, Re. S. N. 07/535,218, Filed June 8, 1990, Cl. 303/100, ANTI-LOCK BRAKE CONTROL SYSTEM, Alexander Kade, et al., Owner of Record: *General Motors Corp., Detroit, Mich.*, Attorney or Agent: Howard N. Conkey, Ex. Gp.: 313

4,783,183, Re. S. N. 07/524,385, Filed May 17, 1990, Cl. 384/620, THRUST BEARING ASSEMBLY, Cameron Gardella, Owner of Record: *Torrington Co., Torrington, Conn.*, Attorney or Agent: Daniel W. Sixbey, Ex. Gp.: 245

4,812,505, Re. S. N. 07/531,650, Filed June 1, 1990, Cl. 524/377, TREE RESISTANT COMPOSITIONS, Barry Topcik, Owner of Record: *Union Carbide Chemicals and Plastics Co., Inc., Danbury, Conn.*, Attorney or Agent: Saul Bresch, Ex. Gp.: 155

4,816,273, Re. S. N. 07/531,450, Filed May 30, 1990, Cl. 426/393, PROCESS OF PREPARING FROZEN JUICE PRODUCT, Steven Smith, et al., Owner of Record: *Inventor*, Attorney or Agent: Bruce G. Chapman, Ex. Gp.: 132

4,826,466, Re. S. N. 07/530,118, Filed May 29, 1990, Cl. 464/173, STEERING COLUMN BOOT, Fred Triquet, Owner of Record: *Arco Industries Corp., Schoolcraft, Mich.*, Attorney or Agent: Kenneth I. Kohn, Ex. Gp.: 245

4,841,831, Re. S. N. 07/533,527, Filed June 5, 1990, Cl. 86/27, INDEXING RELOADER OF CARTRIDGES, Walter W. Bender, et al., Owner of Record: *Blount, Inc., Portland, Oreg.*, Attorney or Agent: Robert L. Harrington, Ex. Gp.: 221

4,848,074, Re. S. N. 07/526,658, Filed May 29, 1990, Cl. 56/400.12, LEAF BUNDLING RAKE, Lewis E. Allen, Owner of Record: *Inventor*, Attorney or Agent: Norman B. Rainer, Ex. Gp.: 356

4,863,606, Re. S. N. 07/532,560, Filed June 4, 1990, Cl. 210/605, WASTE WATER TREATING PROCESS, Ronald W. Ryall, Owner of Record: *Inventor*, Attorney or Agent: John J. Conners, Ex. Gp.: 136

4,880,067, Re. S. N. 07/530,816, Filed May 30, 1990, Cl. 175/107, APPARATUS FOR DRILLING A CURVED BOREHOLE, Henk H. Jelsma, Owner of Record: *Baroid Technology, Inc., Houston, Tex.*, Attorney or Agent: Loren G. Helmreich, Ex. Gp.: 356

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

De. 292,030, Reexam No. 90/002,049, Requested June 12, 1990, Cl. D28/041, ORNAMENTAL HEADBAND OR SIMILIAR OBJECTS, Rommy Revson, Owner of Record: *Inventor, New York, N. Y.*, Attorney or Agent: Cohen, Potani & Lieberman, Ex. Gp.: 292, Requester: Riviera Trading Corp., New York, N. Y.

3,896,050, Reexam. No. 90/002,050, Requested June 12, 1990, Cl. 433/057, JAW MOVEMENT SIMULATOR, Robert L. Lee, Owner of Record: *Inventor, Colton, Calif.*, Attorney or Agent: Knobbe, Martens, Olson & Bear, Ex. Gp.: 333, Requester: W. E. Jackson, Larson & Taylor, Arlington, Va.

3,976,230, Reexam. No. 90/002,051, Requested June 12, 1990, Cl. 222/146, SYSTEM FOR DISPENSING POLYURETHANE AND THE LIKE, Charles R. Sperry, Owner of Record: *Instapak Corp., A Corp. of N.Y., Danbury, Conn.*, Attorney or Agent: Albert Siegel, Ex. Gp.: 311, Requester: E. R. Carpenter Co., Inc., Richmond, Va.

4,067,079, Reexam. No. 90/002,052, Requested June 12, 1990, Cl. 005/081, PATIENT SHIFTING AID AND METHOD OF USING SAME, Ernest C. Buchman, Owner of Record: *Inventor, Houston, Tex.*, Attorney or Agent: Pravel & Wilson, Ex. Gp.: 351, Requester: Paul R. Gardner, Los Angeles, Calif.

4,571,456, Reexam. No. 90/002,053, Requested June 12, 1990, Cl. 179/002, PORTABLE COMPUTER, David C. Paulsen, et al., Owner of Record: *Grid Systems Corp., A Corp. of Calif., Mountain View, Calif.*, Attorney or Agent: Donald C. Feix, Ex. Gp.: 261, Requester: Dean A. Monco, Chicago, Ill.

Survey of Registered Practitioners in Patent Cases

Pursuant to 37 CFR 10.11(b), a survey letter was mailed on January 31, 1990 fron the Office of Enrollment and Discipline (OED) to all practitioners in patent cases whose last names began with P through S. Enclosed with the letter was a data sheet which should have been completed and returned to OED as soon as possible. All data sheets returned to OED were acknowledged. Failure by a practitioner to submit a completed data sheet within the time period specified in the survey letter will result in the practitioner being removed from the register in accordance with 37 CFR 10.11(b).

If your last name begins with P through S and you did not receive a data sheet or if you returned the data sheet to OED and you did not receive an acknowledgement within three (3) months after returning the data sheet to OED, please contact Shirley B. Rasheed at (703) 557-1728.

June 26, 1990 CAMERON WEIFENBACH, *Director*
Office of Enrollment & Discipline

PATENT NOTICES

Certificates of Correction For Week of July 24, 1990

Re. 32,640	4,826,944	4,847,696	4,859,494
4,652,639	4,827,499	4,847,797	4,859,845
4,679,488	4,828,899	4,847,972	4,860,010
4,699,396	4,829,027	4,848,137	4,860,291
4,712,859	4,830,028	4,848,563	4,860,992
4,733,721	4,830,191	4,848,750	4,861,823
4,734,868	4,830,756	4,848,947	4,862,042
4,735,476	4,831,169	4,848,977	4,862,059
4,750,078	4,831,382	4,849,716	4,862,324
4,760,117	4,833,172	4,849,928	4,862,751
4,761,162	4,833,230	4,849,945	4,892,800
4,761,661	4,834,129	4,850,281	4,862,890
4,766,090	4,834,151	4,850,487	4,862,910
4,766,320	4,834,712	4,850,664	4,862,977
4,768,379	4,835,078	4,851,418	4,863,126
4,769,974	4,835,305	4,851,660	4,863,147
4,776,827	4,837,450	4,852,110	4,863,270
4,785,147	4,837,461	4,852,144	4,863,511
4,785,692	4,838,708	4,852,442	4,863,809
4,789,620	4,839,847	4,852,658	4,864,070
4,791,259	4,840,676	4,852,958	4,864,546
4,792,023	4,841,001	4,853,490	4,864,892
4,793,307	4,841,015	4,853,516	4,864,950
4,793,879	4,841,457	4,853,590	4,965,111
4,794,427	4,841,712	4,854,104	4,965,176
4,794,572	4,841,745	4,854,496	4,965,181
4,799,445	4,842,453	4,855,503	4,865,205
4,801,097	4,842,724	4,855,825	4,865,394
4,805,070	4,843,670	4,855,885	4,865,470
4,807,538	4,843,833	4,855,908	4,865,507
4,807,809	4,844,144	4,856,001	4,865,587
4,810,079	4,844,228	4,856,029	4,866,642
4,811,689	4,844,390	4,856,055	4,866,680
4,811,758	4,844,652	4,856,921	4,866,846
4,812,555	4,845,029	4,857,202	4,866,881
4,813,525	4,845,030	4,857,793	4,868,481
4,817,497	4,845,535	4,857,878	4,869,991
4,818,239	4,846,985	4,858,260	4,871,258
4,820,249	4,847,060	4,858,599	4,879,403
4,820,443	4,847,206	4,858,619	4,882,137
4,821,980	4,847,281	4,858,798	4,885,357
4,823,932	4,847,368	4,858,861	4,885,672
4,824,975	4,847,542	4,859,091	4,896,617

SPECIAL BOXES FOR MAIL

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Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
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Box ITU	All Intent to Use documents excluding the initial application and amendments to allege use.
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Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.
Box Assignments	All assignment documents except those filed in new patent applications.
Box SEQUENCE	All application papers, computer readable forms and fees related to applications containing nucleotide sequence and/or amino acid sequence disclosures in accordance with 37 CFR §§ 1.821 through 1.825.

Reference Collection of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to libary, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effctive access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
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Alaska	Anchorage: Z. J. Loussac Public Library	(907) 261-2916
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-8874
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 275-2562
	Tampa: Tampa Campus Library, University of Central Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	Not Yet Operational
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
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Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada-Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(201) 932-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 737-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	Not Yet Operational
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372

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	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF June 16, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director.	7-7-87
ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director.	10-18-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director	5-12-88
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-20-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—ROBERT E. GARRETT, Director.	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	3-8-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-9-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director.	3-31-88
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 STEWART LEVY, Acting Director	4-22-88
DESIGN, GROUP 290—ROBERT E. GARRETT, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-24-89
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-23-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	10-25-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director.	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director	5-5-89

Expiration of patents: The patents within the range of numbers indicated below expire during June 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

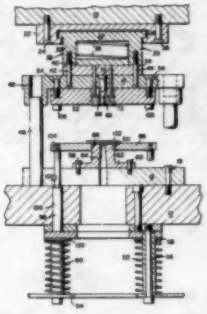
Patents	Numbers 3,736,595 to 3,742,517 inclusive
Plant Patents	3,350 to 3,369 inclusive

REEXAMINATIONS

JULY 24, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,267,753 (1329th)
APPARATUS FOR PRODUCING A BLANK FROM STOCK MATERIAL
Edward D. Bennett, 1401 S. Ocean Blvd. Apt. 902, Pompano Beach, Fla. 33062
Reexamination Request No. 90/001,815, Jul. 28, 1989.
Reexamination Certificate for Patent No. 4,267,753, issued May 19, 1981, Ser. No. 92,403, Nov. 8, 1979.
Filed Jul. 28, 1989, Ser. No. 92,403
Int. Cl.[5] B21D *28/16, 45/08*
U.S. Cl. 83—124



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **8** and **17** are determined to be patentable as amended.

Claims **2–7**, **9–16** and **18**, dependent on an amended claim, are determined to be patentable.

1. A blanking punch and die combination comprising a blanking die defining an opening *of any shape*, a cooperating blanking punch dimensioned closely to mate with said opening, *with a clearance dimension between the blanking punch and said blanking die opening of about one percent of the thickness of the stock to be blanked*, the *stock engaging blanking* die edge defining said opening being rounded, a stock engaging shedder displaceable within said die opening to engage and clamp stock, a stripper encircling said blanking punch and displaceable therealong to remove surplus stock after a blanking operation and spacer means disposed between the blanking die and the stripper to space the blanking die and the stripper apart by a distance exceeding the thickness of said stock.

B1 4,303,721 (1330th)
CLOSED CELL FOAM PRINTING BLANKET
Jorge M. Rodriguez, Miami, Fla., assignor to W. R. Grace & Co.
Reexamination Request No. 90/001,764, Apr. 27, 1989.
Reexamination Certificate for Patent No. 4,303,721, issued Dec. 1, 1981, Ser. No. 59,343, Jul. 20, 1979.
Filed Apr. 27, 1989, Ser. No. 59,343
Int. Cl.[5] B32B *7/02, 5/18*
U.S. Cl. 428—213

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **3** and **6** are determined to be patentable as amended.

Claims **2**, **4** and **5**, dependent on an amended claim, are determined to be patentable.

New claims **7–9** are added and determined to be patentable.

1. A resilient compressible offset printing blanket of the type comprising

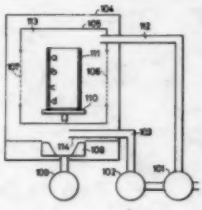
(a) a base layer comprising a member chosen from the group consisting of a machine direction, elongation stabilizing material and an adhesive material;

(b) a compressible layer over said base layer and comprising foamed rubber having a substantially closed celled structure; and

(c) an ink transfer face layer over said compressible layer,

the improvement comprising said resilient compressible offset printing blanket being free of any intervening woven stabilizing layer between the foamed rubber compressible layer and the face layer while having means giving the substance of the stability that would be provided by such a woven stabilizing layer between the foamed rubber compressible layer and the face layer, *said means being a hard rubber layer formed of a rubber and an inorganic filler, or carbon black and a thermosetting polymer.* .

B1 4,481,273 (1331st)
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER AND PREPARATION THEREOF
Kazuharu Katagiri; Yoshihiro Oguchi, both of Yokohama, and Yoshio Takasu, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Japan
Reexamination Request No. 90/001,792, Jun. 20, 1989.
Reexamination Certificate for Patent No. 4,481,273, issued Nov. 6, 1984, Ser. No. 496,430, May 20, 1983.
Filed Jun. 20, 1989, Ser. No. 496,430
Claims priority, application Japan, May 27, 1982, 57-90268
Int. Cl.[5] G03G *5/04, 5/047*
U.S. Cl. 430—59



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2**, **6**, **10–12**, **15**, **17**, and **19–24** are cancelled.

Claims **1**, **3–5**, **7–9**, **13**, **14**, **16**, **18**, **25**, **26** and **31** are determined to be patentable as amended.

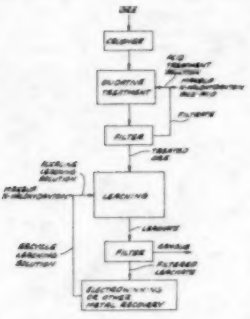
Claims **27–30**, **32** and **33**, dependent on an amended claim, are determined to be patentable.

1. [An] *A cylindrical* electrophotographic photosensitve

member comprising [a photosensitive layer] *a charge generating layer having a thickness of not more than 5μ and comprising a coated film having organic pigment particles dispersed in a binder and a charge transport layer laid thereon, said charge generating layer having been* formed by [coating] *applying* a coating solution containing [a photoconductive compound on an electroconductive] *said organic pigment particles dispersed therein to a cylindrical* substrate of a metal or metal alloy [followed by drying, said electroconductive substrate] having a C/ρ value of 0.250 or less when the heat capacity per unit surface area of said [electroconductive] *cylindrical* substrate is made C cal/cm^2.°C. and the thermal conductivity of the material for said [electroconductive] *cylindrical* substrate is made ρ cal/cm.sec.°C. *followed by drying.*

18. An electrophotographic photosensitive member according to claim [6] *1*, wherein said charge transport layer is a coated film having at least one kind of photoconductive compound selected from the troup consisting of pyrazolines, hydrazones, diphenylmethanes, triphenylmethanes, triphenylamines, oxadiazoles, benzooxazoles, oxazoles, thiazoles, styryls and photoconductive polymers.

B1 4,637,865 (1332nd)
PROCESS FOR METAL RECOVERY AND COMPOSITIONS USEFUL THEREIN
Rodney H. Sergent, and Kenneth N. Thanstrom, assignors to Great Lakes Chemical Corp., West Lafayette, Ind.
Reexamination Request No. 90/001,891, Nov. 7, 1989.
Reexamination Certificate for Patent No. 4,637,865, issued Jan. 20, 1987, Ser. No. 766,833, Aug. 16, 1985.
Filed Nov. 7, 1989, Ser. No. 766,833
Int. Cl.^{5} C25C *1/20*
U.S. Cl. 204—111

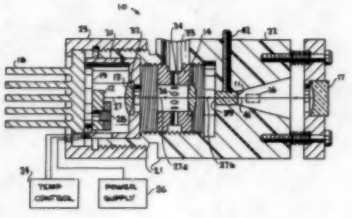


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–50** is confirmed.

1. A process for extracting a precious metal or base metal from a source material containing said metal, the process comprising contacting said source material with an aqueous leaching solution containing a leaching agent comprising an N-halohydantoin compound, thereby producing an aqueous leachate containing said metal.

B1 4,653,056 (1333rd)
ND-YAG LASER
Thomas M. Baer, Mountain View, and Mark S. Keirstead, San Jose, both of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.
Reexamination Request No. 90/001,830, Aug. 24, 1989.
Reexamination Certificate for Patent No. 4,653,056, issued Mar. 24, 1987, Ser. No. 730,002, May 1, 1985.
Filed Aug. 24, 1989, Ser. No. 730,002
Int. Cl.^{5} H01S *3/091*
U.S. Cl. 372—75



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–44** is confirmed.

Claim **45** is determined to be patentable as amended.

Claims **46** and **47**, dependent on an amended claim, are determined to be patentable.

1. A high efficiency, diode pumped array, compact neodymium-YAG laser, comprising,

a neodymium-YAG laser rod having a front end and a back end, a housing with means holding the neodymium-YAG rod in fixed position in the housing with its front end forward,

a laser diode array for pumping the neodymium-YAG rod, having an output frequency sufficiently matched to the rod to pump the rod, secured in the housing behind and in optical alignment with the rod,

output coupler means including a mirrored surface forming a front end of a laser cavity,

a rear mirror means forming a back end of the laser cavity, with the neodymium-YAG rod within the cavity,

a frequency doubler within the laser cavity, positioned to receive the output beam of the laser rod and to halve its wavelength, doubling its frequency, and

polarization control means for adjusting and maintaining the polarization of the laser beam to a polarization which optimizes frequency doubling of the laser beam by the frequency doubler.

B1 4,692,599 (1334th)

COIL SUPPORT INSULATOR FOR ELECTRIC HEATER

H. Keith Howard, and Jimmy L. Sherrill, both of Cookeville, Tenn., assignors to Adams Industries Inc., Cookeville, Tenn.

Reexamination Request No. 90/001,856, Oct. 2, 1989.

Reexamination Certificate for Patent No. 4,692,599, issued Sep. 8, 1987, Ser. No. 785,595, Oct. 8, 1985.

Continuation of Ser. No. 597,701, Apr. 6, 1984, Pat. No. 4,559,412, which is a division of Ser. No. 206,899, Nov. 14, 1980, Pat. No. 4,458,141. This application Oct. 2, 1989, Ser. No. 785,595

The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.

Int. Cl.[5] **H05B** *3/06*; **H01B** *17/56*

U.S. Cl. 219—532

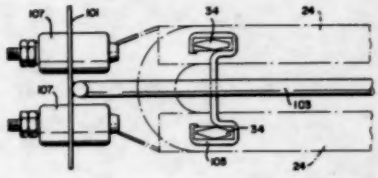
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2** to **6**, dependent on an amended claim, are determined to be patentable.

New claims **7** to **10** are added and determined to be patentable.

1. An electric heater comprising an elongate structural member and an insulator means for supporting a heater coil, wherein said insulator means comprises an integral elongate element having at least one notch therein [adapted to support] *for supporting* said heater coil by engaging at least one individual convolution thereof, said insulator having *an exterior surface with at least two faces which extend in transverse*



directions, groove means in [an] *said* exterior surface *for* engaging said structural member, *wherein* said structural member [comprising] *comprises* an elongate rod at least partially encircling said insulator means *by extending along said at least two faces* and [recieve] *received* in said groove means to support said insulator means.

REISSUES

JULY 24, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,270

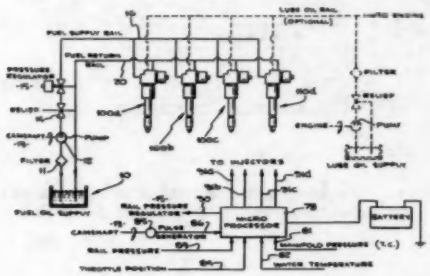
PRESSURE-CONTROLLED FUEL INJECTION FOR INTERNAL COMBUSTION ENGINES

Niels J. Beck, Bonita; Michael A. Calkins, El Cajon; William E. Weseloh, San Diego, and Robert L. Barkhimer, Chula Vista, all of Calif., assignors to BKM, Inc., San Diego, Calif.

Original No. 4,628,881, dated Dec. 16, 1986, Ser. No. 700,692, Feb. 12, 1985. Continuation-in-part of Ser. No. 418,688, Sep. 16, 1982, abandoned. Application for reissue Dec. 14, 1988, Ser. No. 284,472

Int. Cl.[5] F02M *47/02*

U.S. Cl. 123—447 **68 Claims**



67. A pressure-metered fuel injection method comprising the steps of

(a) *selecting microprocessor means for controlling liquid pressure level,*

(*b*) selecting a *liquid* fuel source having a [controllable] pressure level *that is controllable by said microprocessor means,*

[(b)] (*c*) supplying liquid fuel *from said source* through a fluid pathway and a non-return valve to an accumulator injector,

[(c)] (*d*) under control of the source pressure, allowing fuel to flow through said pathway and through the non-return valve into the accumulator injector throughout a time interval which is of sufficient duration that the fuel pressure inside the accumulator injector then becomes essentially a function of the source pressure rather than of the parameters of the pathway,

[(d)] (*e*) then closing off and venting the pathway so that the non-return valve closes, and the injector injects a fuel charge whose mass is linearly related to the source pressure, and

[(e)] (*f*) thereafter adjusting the source pressure *by said microprocessor means* so as to adjust the mass of [the next] succeeding fuel [charge] *charges.*

Re. 33,271

DENTAL JACKET CROWN, COPING AND METHOD OF CONSTRUCTION

Itzhak Shoher, 50 Shlomo Hamelich St., Tel Aviv, and Aharon Whiteman, 13 J1 Perez St., Petach Tikvah, both of Israel

Original No. 4,492,579, dated Jan. 8, 1985, Ser. No. 487,839, Apr. 22, 1983. Continuation-in-part of Ser. No. 414,415, Sep. 2, 1982, Pat. No. 4,459,112. Application for reissue Dec. 6, 1985, Ser. No. 805,825

Int. Cl.[5] A61C *5/08*

U.S. Cl. 433—222.1 **11 Claims**

1. A *dental* jacket crown comprising a composite body [including] *formed from* a thin foil of high fusing temperature metal, [substantially of platinum] having a surface geometry conforming to a die to which it has been adapted with the foil having [a minimum of at least three folded over pleats in a substantial symmetrical arrangement around the body of a foil with each pleat forming a triangular like flap in the unfolded position and wherein said foil has] *arranged about* an unfolded

area substantially in the center of the foil [body with said foil having] *and* at least one thin coated layer of a gold based noble metal composition of up to 100% gold superimposed over one surface of said [thin foil and disposed beneath the folded over pleats] *high fusing temperature metal* and a relatively thick outer coating of a dental veneering material.

Re. 33,272

FILTER CARTRIDGE FOR FILTERING APPARATUSES

Ernst Turck, Peter-Parler-Strasse 33, D-8264 Waldkraiburg, Fed. Rep. of Germany

Original No. 4,619,676, dated Oct. 28, 1986, Ser. No. 678,282, Mar. 28, 1984. Application for reissue Jun. 27, 1989, Ser. No. 372,055

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311863

Int. Cl.[5] B01D *46/12*

U.S. Cl. 55—500 **5 Claims**

1. A filter cartridge for filtering apparatuses for removing impurities from hot and/or highly pressurized flowing gases, with zig-zag formed, gas-penetrated filter material folded at acute angles, whose part surfaces caused by the folding, between the fold lines, are arranged in relatively close juxtaposition to each other, characterized in that: one thin-walled strip **15** is disposed and arranged in the spaces between each two adjacent part surfaces **12, 13** of the filter material **11**, said thin-walled strip **15** having one straight-formed edge **16** lying in the inside of the fold **14** and one opposite lying zig-zag formed edge **17**, *the zig-zag edge being straight lines to form sharp peaks,* and in that, relative to the medial plane **19** of said thin-walled strip **15**, the bend or crest lines **18** rise steadily *as straight bend lines* from said one straight formed edge **16** toward the sharp peaks of said zig-zag formed edge, *whereby each said strip 15 engages the adjacent surfaces 12, 13 of the associated filter*

material fold solely by a line to surface engagement of each said straight bend line 18 with the surface of said associated filter material folds.

Re. 33,273

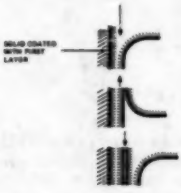
MATERIALS HAVING IMPROVED NONFOULING CHARACTERISTICS AND METHOD OF MAKING SAME

Lois M. Speaker, Atlanta, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.

Original No. 4,554,076, dated Nov. 19, 1985, Ser. No. 409,097, Aug. 18, 1982. Application for reissue Nov. 13, 1987, Ser. No. 120,599

Int. Cl.[5] B01D *31/00*

U.S. Cl. 210—639 **32 Claims**



1. A method of modifying a surface of a separatory material comprising the step of depositing on said surface **[**a**]** *at least one oriented monomolecular* layer of **[**a**]** *an essentially water-insoluble* fluorinated amphiphilic molecule *which is capable of forming an oriented monomolecular layer and* which is oriented such that the fluorinated portion of said molecule extends outwardly from said surface.

Re. 33,274

SELECTIVE DISORDERING OF WELL STRUCTURES BY LASER ANNEALING

Robert D. Burnham, Wheaton, Ill., and Noble M. Johnson, Menlo Park, Calif., assignors to Xerox Corporation, Stamford, Conn.

Original No. 4,654,090, dated Mar. 31, 1987, Ser. No. 775,979, Sep. 13, 1985. Application for reissue Jan. 31, 1989, Ser. No. 304,671

Int. Cl.[5] H01L *21/265, 21/203*

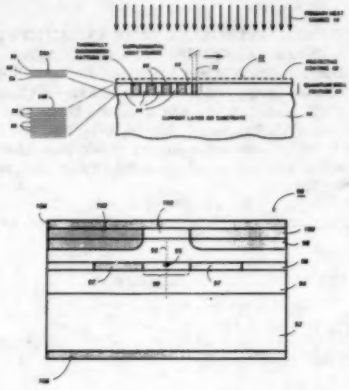
U.S. Cl. 437—174 **13 Claims**

1. A method of converting selected areas of a semiconductor structure into a disordered alloy via thermal disordering comprising a well feature epitaxially deposited on a semiconductor support, said well feature comprising at least one first well layer of narrow bandgap material deposited adjacent to at least a second layer of wider bandgap material or interposed between second and third layers of wider bandgap material, said disordered alloy exhibiting higher bandgap and lower refractive index properties than said first layer and comprising the steps of:

(a) placing said structure within a protective environment to prevent the escape of volatile components from said structure during subsequent processing,

(b) heating said structure to a background temperature **[**just**]** below the temperature required to achieve rapid thermal disordering of said feature,

(c) scanning said structure with a laser beam while maintaining said background temperature to disorder said well feature in selected regions scanned by said laser beam, said disordering achieved due to the additional heat supplied by said laser beam forming a pattern of wider bandgap and lower refractive index properties proscribed in said feature by the scanning trace of said laser beam compared to areas of said feature not scanned by said laser beam.



Re. 33,275

ELECTRON SPECTROMETER

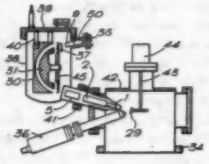
Ian R. M. Wardell, Heathfield, and Peter A. Coxon, Buxted, both of United Kingdom, assignors to VG Instruments Group, Limited, Crawley, United Kingdom

Original No. 4,758,723, dated Jul. 19, 1988, Ser. No. 50,403, May 18, 1987. Application for reissue Sep. 18, 1989, Ser. No. 409,440

Claims priority, application United Kingdom, May 19, 1986, 8612099

Int. Cl.[5] H01J *49/44*

U.S. Cl. 250—305 **17 Claims**



1. An electron spectrometer operable to produce an image of an electron emitting surface, said spectrometer comprising in sequence:

(a) means for causing electrons to be emitted from said surface;

(b) a first **[**electrostatic**]** lens system arranged to project at least some of said electrons onto a first diffraction plane as a Fourier transform of an electron image of at least a part of said surface;

(c) a torroidal capacitor type electrostatic energy analyzer having an object plane and conjugate thereto a first image plane, said analyzer being disposed with said object plane coincident with said first diffraction plane and being arranged to project electrons of said Fourier transform as an energy dispersed Fourier transform in said first image plane;

(d) energy selection means for transmitting electrons of said

energy dispersed Fourier transform having energies only within a selected range; and

(e) a second [electrostatic] lens system arranged to receive electrons transmitted by said energy selection means and therewith to project an electron image of at least a part of said surface onto a second image plane.

Re. 33,276

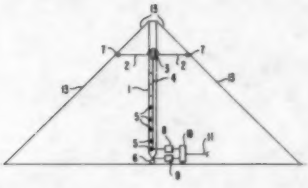
METHOD AND APPARATUS FOR SEPARATELY CONTROLLING SKY WAVE AND GROUND WAVE RADIATION FROM A MEDIUM WAVE ANTENNA

Ogden L. Presholdt, 214 Laurel Hollow Dr., Nokomis, Fla. 34275

Original No. 4,731,615, dated Mar. 15, 1988, Ser. No. 777,252, Sep. 18, 1985. Application for reissue Jul. 14, 1988, Ser. No. 219,006

Int. Cl.[5] H01Q 21/00

U.S. Cl. 343—725 15 Claims



10. An antenna system for controlling the sky wave generated by a first station transmitting radio frequency signals, said first station having a proscribed angle of elevation for ionospheric reflection in relation to another station which is a predetermined distance from said first station, the antenna system comprising:

a first antenna means (antenna means A) oriented in a direction having a vertical component for generating an electromagnetic field E from said vertical component carrying said radio frequency signals, said field from said vertical component having a field component $E_{\theta A}$ determined with respect to a zenith direction theta;

a second antenna means (antenna means B) oriented in a direction having a horizontal component for generating another electromagnetic field from said horizontal component carrying said radio frequency signals, said another electromagnetic field from said horizontal component having a further field component $E_{\theta B}$ determined with respect to said zenith direction theta; and

means for setting the magnitude and phase of said field components $E_{\theta A}$ and $E_{\theta B}$ with respect to each other such that at said proscribed angle of elevation for ionospheric reflection said field component $E_{\theta A}$ substantially cancels out said further field component $E_{\theta B}$.

Re. 33,277

AUTOMATIC FOCUSING DEVICE FOR USE IN A CAMERA

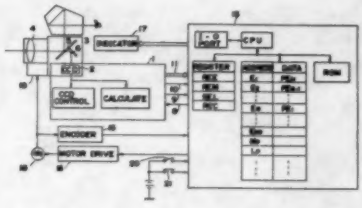
Norio Ishikawa, Osaka, and Takanobu Omaki, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Original No. 4,445,761, dated May 1, 1984, Ser. No. 431,288, Oct. 1, 1982. Continuation of Ser. No. 858,211, Apr. 30, 1986, abandoned. Application for reissue May 6, 1988, Ser. No. 190,834

Claims priority, application Japan, Oct. 2, 1981, 56-157921

Int. Cl.[5] G03B 3/10

U.S. Cl. 354—402 20 Claims



16. An automatic focusing device for use in a camera, comprising:

means for receiving light through an objective lens of the camera to produce electric signals;

means for processing the electric signals to generate a defocusing information indicative of defocusing degree and defocusing direction relative to an ideal focal plane;

means for generating a driving power for automatic focus control;

means for controlling the generating means in response to the processing means;

means for causing the receiving means and the processing means to periodically repeat the production of the electric signals and the generation of the defocusing information during the generation of the driving power to keep the controlling means informed of the newest defocusing information in the course of generation of the driving power;

means for detecting a condition for stopping the generation of the driving power to stop the generation of the driving power on the condition; and

means for confirming the establishment of the condition in response to the processing means with the generation of the driving power completely stopped to determine the necessity of reopening the generation of the driving power in case that the condition is not really established.

PLANT PATENTS

GRANTED JULY 24, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,276
ROSE PLANT — MEIZOGREL VARIETY

Alain A. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed May 10, 1989, Ser. No. 350,117
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of Miniature rose plant characterized by the following combination of characteristics:

(a) forms in abundance on a continuous basis attractive fully-double blossoms having firm petals,
(b) forms vigorous vegetation,
(c) exhibits a compact and bushy growth habit, and
(d) is well suited for greenhouse forcing while growing in small containers under low light conditions;

substantially as herein shown and described.

7,277
ROSE PLANT-MEITONJE VARIETY

Marie-Louise Meilland, deceased, late of Antibes, France (by Jean-Pierre le Naour, legal representative), assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Mar. 9, 1989, Ser. No. 321,144
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of Miniature rose plant characterized by the following combination of characteristics:

(a) forms in abundance on a continuous basis attractive fully double blossoms which are carmine rose in coloration,
(b) exhibits a vigorous, compact and bushy growth habit, and
(c) is not particularly affected by cryptogamic diseases;

substantially as herein shown and described.

7,278
ROSE PLANT — MEIMAFRIS VARIETY

Marie-Louise Meilland, late of Antibes, France (by Jean-Pierre Le Naour, legal representative), assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Mar. 9, 1989, Ser. No. 321,145
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—14 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

(a) forms in abundance very double long lasting cream white blossoms which exhibit a strong fragrance,
(b) exhibits an upright, vigorous, compact and bushy growth habit,
(c) is well adapted for growing in containers, and
(d) is not particularly affected by cryptogamic diseases;

substantially as herein shown and described.

7,279
SEEDLESS HYBRID MAPLE TREE NAMED CELZAM

James W. Zampini, Perry, Ohio, assignor to New Plants, Perry, Ohio

Continuation of Ser. No. 129,401, Dec. 3, 1987, abandoned, which is a continuation of Ser. No. 895,891, Aug. 12, 1986, abandoned. This application Dec. 27, 1988, Ser. No. 290,842
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of substantially seedless hybrid Acer, (maple tree), substantially as herein shown and described, characterized particularly be being substantially seedless, having rapid growth when young, and exhibiting an extremely dense upright structure.

7,280
BLC. MEM. RALPH PLACENTIA C.V. TOREADOR

Ernest Hetherington, Arcadia, Calif., assignor to Stewart Orchids, Carpinteria, Calif.

Filed Nov. 25, 1988, Ser. No. 276,425
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of a hybrid Brassolaeliocattleya orchid, substantially as described and illustrated herein which is distinguished from siblings of this grex Blc. Mem. Ralph Placentia and other orchids by its combination of intense, dark, ruby-purple flower color, superior flower substance, size and strength in stem structure, and vigorous, reliable uniform blooming.

7,281
SARDIS

Th. A. Segers, Hoofddorp, Netherlands, assignor to Twyford Plant Laboratories, Inc., Santa Paula, Calif.

Filed Feb. 28, 1989, Ser. No. 316,908
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. The new distinct variety of gerbera plant herein described and illustrated and identified by the characteristics enumerated above.

PATENTS

GRANTED JUL. 24, 1990

ERRATA

For CLASS	See PATENT NO.
475-039	4,942,580
475-083	4,942,780
475-342	4,942,781
606-057	4,942,872
606-230	4,942,875
273-139	4,943,090
285-012	4,943,091
280-660	4,943,092
210-164	4,943,100
351-235	4,943,162
411-342	4,943,253
604-002	4,943,274
423-010	4,943,318
420-417	4,943,322
423-566	4,943,411
585-471	4,943,553
521-079	4,943,594
524-265	4,943,601
524-600	4,943,602
525-415	4,943,610
536-124	4,943,649
544-330	4,943,675
525-383	4,943,676
528-405	4,943,677
514-374	4,943,678
562-561	4,943,679
427-154	4,943,680
430-495	4,943,681
528-353	4,943,682
376-245	4,943,683
428-034	4,943,684
428-035	4,943,780
355-271	4,943,863
365-207	4,943,952
367-137	4,943,956
428-694	4,943,957
365-222	4,943,960
365-228	4,943,961
365-230	4,943,962
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318-568 4,944,027
324-207 4,944,028
340-825 4,944,029
354-403 4,944,030
355-206 4,944,031
358-012 4,944,032
364-470 4,944,033
364-522 4,944,034
364-556 4,944,035
367-043 4,944,036
369-138 4,944,037
370-085 4,944,038

PATENTS

GRANTED JULY 24, 1990

GENERAL AND MECHANICAL

4,942,624

PROTECTIVE ARM GEAR

Soo S. Cho, Roseland, Fla., assignor to Macho Products, Inc., Palm Bay, Fla.

Filed Jul. 28, 1988, Ser. No. 225,256
Int. Cl.[5] A41D *13/08*
U.S. Cl. 2—16 **11 Claims**

1. For use by a person receiving blows from a participant in martial arts activities or the like, an improved protective device for the arm of the wearer comprising:

a main elongated body portion formed of a resilient, conformable foam material, the main body portion having an enlarged main section adapted to partially encompass and comform to the outside of a wearer's forearm, and a hand section extending outwardly from the main section and being adapted to cover the hand and knuckles of a wearer, and the main body portion having an interior surface and an exterior surface; and

strap means to secure the main body portion to the arm of a wearer;

the device further comprising a first elongated hand piece extending laterally across the interior surface of the main body portion and securing opposite edges of the hand section; a first elongated cross-piece extending longitudinally across the interior surface from a central part of the first hand piece to an outer end of the hand section; a second elongated hand piece extending laterally across the interior surface of the main body portion, said second hand piece being spaced inwardly toward said main section from said first hand piece and also securing opposite edges of the hand section; and a second elongated cross-piece extending from a central part of the second hand piece to connect the interior surface at a point adjacent the junction of the hand section and the main section;

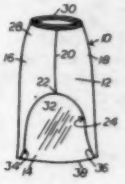
the first and second hand pieces and the first and second cross-pieces being dimensioned, configured and adapted so that the fingers of the wearer can be inserted between the hand pieces and the interior surface with the cross-pieces being located between adjacent fingers of the wearer, so that when the fingertips of the wearer are curled around the first hand piece, the second cross-piece acts as a limit to hold the second hand piece in fixed position relative to the wearer's hand at the base of the fingers and the first cross-piece acts to draw the outer end of the hand section inwardly toward the main section with the first hand piece, to cause the hand section to conform to the wearer's closed hand when the fingertips are curled into a fist.

4,942,625

SLIP

Linda Mecadon, 3432 San Juan Canyon Rd., San Juan Bautista, Calif. 95054

Filed Nov. 17, 1988, Ser. No. 272,580
Int. Cl.[5] A41B *9/00*
U.S. Cl. 2—73 **14 Claims**



1. An article of lingerie comprising:

a slip having a waist portion and pair of spaced panels extending downwardly form the waist portion, one of the panels having a midpoint, a bottom edge and an opening therein in the lower portion of said one panel, said opening extending downwardly from a location near the midpoint of said one panel and having a transverse dimension which progressively increases as the bottom edge of said one panel is approached, said one panel having an upper, substantially concave edge near the upper end of the opening, a pair of convex edges near the bottom edge of the one panel, and a pair of generally vertical edges interconnecting the ends of the concave edge with respective convex edges, whereby the opening is substantially bell-shaped.

4,942,626

NEEDLESTICK PROTECTIVE GLOVE

Joseph A. Stern, Hampton; Stephen L. Green, Newport News; Charles B. King, and Sharon B. May, both of Hampton, all of Va., assignors to Medev Corporation, Hampton, Va.

Filed Dec. 23, 1988, Ser. No. 289,246
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—161 R **8 Claims**

1. A glove for use by medical personnel to protect them from accidental injuries when handling needles which is adapted to cover substantially the entire hand from the wrist to the fingertips which comprises:

a first discrete layer of a flexible material having a pore size which is smaller than the diameter of a needle and which forms a glove including four finger stalls and a thumb stall, said first layer including at least two openings, one in the

fingerprint area of the index finger stall and the second in the fingerprint area of the middle finger stall, and

a second discrete layer of flexible material having a pore size which is smaller than the diameter of a needle, said second layer being permanently attached to selected areas of said first layer of material to provide said selected areas with sufficient thickness to prevent needle penetration under normal conditions encountered when handling needles, said selected areas comprising all of said thumb stall, and lateral sides of said index finger stall and said middle finger stall.

4,942,627

SCARF

Judy Copprue, 6521 Baccich St., New Orleans, La. 70122

Filed May 8, 1989, Ser. No. 348,385

Int. Cl.[5] A41D *23/00*

U.S. Cl. 2—207 **5 Claims**

1. A scarf, comprising:

a substantially elongated flexible scarf body having a first substantially square portion and a second substantially rectangular portion narrower in width than the first portion integrally connected to the first portion about one of its ends, one side of the second portion and an adjacent side of the first portion being curved at a part of attachment of said one side to said adjacent side, a free end of the second portion having a reduced width; and wherein the free end of the second portion is folded over towards the first portion and secured to the second portion forming a loop, the loop being adapted to receive at least a part of the first portion therethrough to ensure secure tying of the scarf.

4,942,628

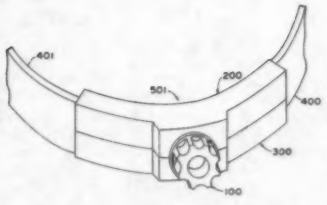
HELMET SUSPENSION HAVING RATCHET ADJUSTMENT

Paul X. Freund, Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Sep. 20, 1989, Ser. No. 409,932

Int. Cl.[5] A42B *3/04, 3/14*

U.S. Cl. 2—416 **2 Claims**



2. A ratchet device for moving two band portions in relation to each other comprising

overlapping band portions, each of said band portions having in alignment an elongate slot lengthwise of the band, a first row of teeth formed in the top edge of one of said slots and a second row of teeth formed in the bottom edge of the other said slot,

a cylindrical adjusting knob having cog teeth at a first end, gripping means at a second end and a beveled circular lip positioned between said first and second end,

case means formed of two case pieces, each said case piece comprising an inner and outer wall forming an arc-shaped channel adapted to receive said band portions and a cavity adapted to receive said adjusting knob, said cavity outer walls having an opening passing said adjusting knob gripping means, said cavity inner walls having a depression adapted to receive said adjusting knob cog teeth, said cog teeth extending through said slots and engaging said first and second rows of teeth,

said adjusting knob first end abutting the depression end wall and said beveled circular lip abutting the inner surface of said outer wall,

and pin means in said depression to yieldingly engage said cog teeth when the adjusting knob is turned.

4,942,629

SKI GOGGLES WITH HEATED LENS

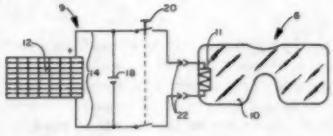
Günter Stadlmann, Linz, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.

Filed May 30, 1989, Ser. No. 358,704

Claims priority, application Fed. Rep. of Germany, May 30, 1988, 3818389

Int. Cl.[5] A61F *9/02*; H05B *3/26*

U.S. Cl. 2—435 **14 Claims**



1. Ski goggles with defogging means comprising: a headband, a lens, an electrical resistive means applying heat to the lens when activated, a power supply for electrical connection to the resistive means for activating same, the power supply including at least one solar cell, and at least one battery connected between the solar cell and the lens resistive means as an additional power reservoir for applying heat to the lens.

4,942,630

SPA WITH DOOR ACCESS FILTER AND CONTROL

Paul Kantor, Saugatuck, and Loren R. Perry, Berrien Springs, both of Mich., assignors to Conway Products Company, Kentwood, Mich.

Filed Oct. 30, 1989, Ser. No. 428,607

Int. Cl.[5] A61H *33/02*

U.S. Cl. 4—542 **30 Claims**

1. A whirlpool spa comprising:

a cabinet;

a reservoir for containing water, mounted in said cabinet;

an opening in said cabinet to facilitate access to the interior thereof;

an access door;

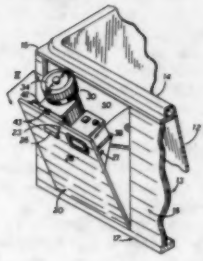
means mounting said access door on said cabinet over said cabinet opening such that said access door can be moved between an open position allowing access through said cabinet opening and a closed position for preventing access through said cabinet opening;

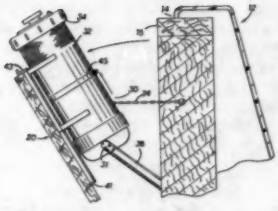
said access door having an outside surface which is exposed to the exterior of said cabinet when said door is closed and an inside surface which is exposed to the exterior of said cabinet only when said access door is opened;

a spa filter in flow communication with said reservoir;

means for pumping water from said reservoir through said spa filter;

said spa filter being mounted on said inside surface of said access door whereby when said access door is moved to





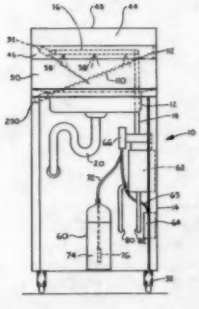
its open position, said spa filter is accessible from the exterior of said cabinet.

4,942,631

HAND SANITIZING STATION

Rudy Rosa, 3626 Baird Ct., Mississauga, Canada, assignor to Barry Robertson and Rudy Rosa, both of Ontario, Canada

Filed Sep. 21, 1988, Ser. No. 247,382
Claims priority, application Canada, Jun. 29, 1988, 570801
Int. Cl.[5] E03C *1/05*
U.S. Cl. 4—623 **20 Claims**



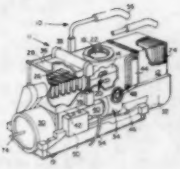
1. A sanitizing device comprising as sink, spray means for spraying a sanitizing solution containing water located above said sink, pipe means for delivering said sanitizing solution to said spray means, said pipe means being adapted for connection to a source of water under pressure, an electrically operated valve for controlling the flow of water through said pipe means, said valve when open permitting water to flow therethrough, a feed pump for delivering a sanitizing chemical concentrate to water passing through said pipe means, first tubing connecting an outlet of said pump to said pipe means, second tubing connected at one end to an inlet of said pump and having an opposite end adapted for placement in a source of said concentrate, and electrical switch means for operating said device, said switch having both an off and an on condition and switching to the one condition upon placement of a user's hands at a predetermined location near said sink, said switch being operatively connected to both said feed pump and said valve and in the on condition causing both said valve to pen and said feed pump to operate simultaneously, wherein said concentrate mixes with the water in said pipe means to form said sanitizing solution.

4,942,632

METHOD FOR WASTE COLLECTION AND STORAGE

William E. Thornton, Jr., Friendswood, and Henry B. Whitmore, San Antonio, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 35,401, Apr. 7, 1989, Pat. No. 4,870,709.
This application Aug. 10, 1989, Ser. No. 391,911
Int. Cl.[5] A47K *11/00*
U.S. Cl. 4—661 **8 Claims**



1. A method for collection of fecal material from a human body comprising the following steps:

first moving a piston means for sweeping and compaction of fecal material within a contained body structure from a storage position to a use position to receive said fecal material

uncovering a seat opening for receiving said fecal material therethrough, said first moving step actuating said uncovering step as said piston means is drawn to said use position;

drawing air through said seat opening to direct said fecal material through said seat opening into said contained body structure;

filtering said air after said air leaves said body structure through valves in said body structure;

covering a face of said piston means with a sheet of absorbent material;

second moving of said piston means from said use position to said storage position after depositing said fecal material through said seat opening into said contained body structure, said second moving of said piston means (1) sweeping said fecal material from said contained body structure to a storage end thereof; (2) covering said seat opening and closing said valves and (3) compressing said fecal material in said storage end; and

repeating said prior steps for subsequent uses wherein said sheet and said fecal material are left compressed at said storage end during each subsequent said first moving step.

4,942,633

ADJUSTABLE BED

Henry A. Thomas, 6615 Garlinghouse La., Dallas, Tex. 75252, and Larry J. McBride, 3409 Louis Dr., Plano, Tex. 75023

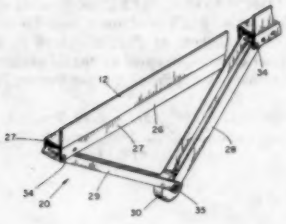
Filed Aug. 23, 1989, Ser. No. 398,165
Int. Cl.[5] A47C *19/00*
U.S. Cl. 5—11 **19 Claims**

14. An adjustable bed including a bed frame for supporting

a mattress and having a head end and a foot end, and a headboard secured to the head end of the bed frame, the adjustable bed further comprising:

the bed frame including first and second side rails, a head cross rail interconnecting the first and second side rails and positioned generally adjacent the head end of the bed frame, and a foot cross rail interconnecting the first and second side rails and positioned generally adjacent the foot end of the bed frame; and

a plurality of adjustable frame support assemblies each affixed to the bed frame for independently varying the height of the head end of the bed frame with respect to the foot end of the bed frame; and



attachment means for interconnecting the head end of the bed frame to the headboard, the attachment means including a first member pivotably connected to the bed frame, a second member for secured engagement with the headboard, locking means for fixing the pivotable orientation of the first member with respect to the bed frame and fastener means for interconnecting the first and second members, such that the headboard lies substantially within a vertical plane while the side rail attached to the headboard is inclined with respect to the horizontal surface perpendicular to the vertical plane.

4,942,634

DAMPED FLUID DISPLACEMENT SUPPORT SYSTEM AND METHOD FOR MAKING THE SAME

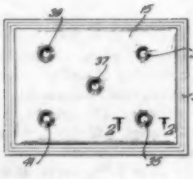
William S. Saloff, Gloversville, and David Saloff, Mount Kisco, both of N.Y., assignors to Lumex, Inc., Bay Shore, N.Y.

PCT No. PCT/US83/01334, § 371 Date Apr. 29, 1985, § 102(e) Date Apr. 29, 1985, PCT Pub. No. WO85/00960, PCT Pub. Date Mar. 14, 1985

PCT Filed Aug. 31, 1983, Ser. No. 744,552

Int. Cl.[5] A47C *27/08*

U.S. Cl. 5—450 **15 Claims**



1. A damped liquid displacement support system which is substantially completely stable with respect to wave action or rolling motion of the liquid contained therein and nonsusceptible to the accumulation of a substantial amount of said liquid in a particular portion thereof when force is applied thereto, irrespective of the spatial disposition of said system, said support system comprising

an envelope of flexible liquid impervious material, said envelope having two substantially parallel panels of substantially the same size, each panel having a border surface, said border surfaces of said panels being sealed together in a liquid impervious seam, one of said panels serving as a body supporting surface,

a core of resilient liquid-absorbent material occupying substantially all the space within said envelope,

a liquid substantially saturating said core,

a valve mounted in said envelope for communication between the interior thereof and its ambience for admitting and discharging liquids and gases, and

at least one interior divider substantially parallel to and the same size as each of said envelope panels and separating said envelope into at least two compartments each of which contains its own liquid-saturated core, said interior divider having a plurality of peripherally disposed openings and no other holes therethrough, said openings in the periphery of said interior divider being located and sized so as to cause said liquid to migrate between the compartments of said envelope in a controlled substantially uniform flow with substantially no wave action or rolling motion and without accumulation of a substantial amount of said liquid in a particular portion of said envelope when pressure is applied to said envelope having a force component perpendicular to said body supporting surface, irrespective of the spatial disposition of said system, whereby an individual may use said envelope as a support cushion, said liquid within said envelope gradually seeking equilibrium about that portion of the individual's body contacting said envelope.

4,942,635

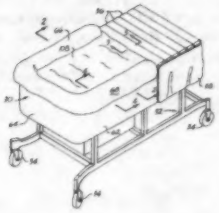
DUAL MODE PATIENT SUPPORT SYSTEM

Thomas S. Hargest; Sohrab Soltninasab, and Robert C. Novack, all of Charleston, S.C., assignors to SSI Medical Services, Inc., Charleston, S.C.

Filed Dec. 20, 1988, Ser. No. 288,071

Int. Cl.[5] A47C *27/10*; A47G *7/04*; A61G *7/057*

U.S. Cl. 5—453 **40 Claims**



1. A patient support system, comprising:

(a) a frame;

(b) at least one inflatable sack carried by said frame to support at least a portion of the patient's body;

(c) a fluidizable medium carried by said frame to support a different portion of the patient's body; and

(d) means for containing said fluidizable medium, and for permitting the diffusion of air therethrough, said containing and diffusing means being carried by said frame and containing said fluidizable medium.

4,942,636

SPRING BEDDING PRODUCT

Terence A. Scott, and Chester R. Yates, both of Carthage, Mo., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Apr. 19, 1989, Ser. No. 340,372

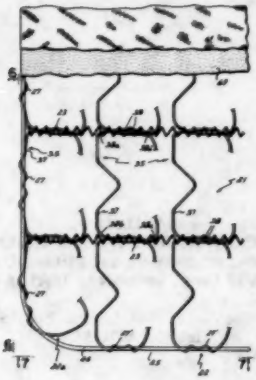
Int. Cl.[5] A47C *27/04, 27/07*

U.S. Cl. 5—475 **21 Claims**

1. A bedding mattress comprising

a spring interior having a plurality of bands of springs, each band of springs comprising a single length of spring wire

shaped to form a plurality of individual coil springs arranged in a longitudinal row, one end turn of each coil spring lying adjacent to a top face of the band and the other end turn of each coil spring lying adjacent to a bottom face of the band, each coil spring being joined to the adjacent coil springs by interconnecting segments integral with the coil springs, one of said interconnecting segments being located substantially in the top face of the band and the other of said interconnecting segments being located substantially in the bottom face of the band, and each interconnecting segment comprising a bridging portion which extends lengthwise of the row and end portions which extend transversely of the bands from the ends of said bridging portion, the bands being disposed side by side so that their top faces lie in a top main face of the spring interior and their bottom faces lie in a bottom



main face of the spring interior, the bands being interconnected by helical lacing wires lying in the top and bottom faces of the bands and extending across the bands, each helical lacing wire embracing adjacent end portions of interconnecting segments of the bands, the spring interior being characterized by

each of said bridging portions being connected at the ends to said end portions of said interconnecting segments by radiused corners of substantially different radii so as to position adjacent bridging portions in substantially longitudinal alignment perpendicular to said helical lacing wires,

padding overlying at least one of said main faces of said spring interior, and

an upholstered covering material encasing said spring interior and said padding.

4,942,637

DOUBLE-PURPOSE HAND TOOL

Her Yeang-Yai, Room, 10, Floor 2, No. 8, Lane 38, Nan Ho Rd., Taichung, Taiwan

Filed Oct. 18, 1989, Ser. No. 423,815

Int. Cl.[5] B25B *7/32*

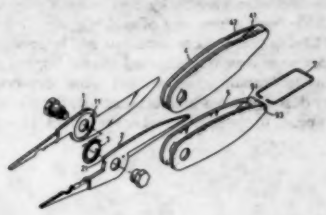
U.S. Cl. 7—135 **7 Claims**

1. A double-purpose hand tool comprising:

two action members pivotally coupled together by a pivot substantially at their middle portions, said two action members being formed with a pair of shear portions at two corresponding ends thereof and a pair of plier portions at the other two corresponding ends thereof;

a biasing means associated with said two action members which can bias said pair of shear portions apart and can bias said pair of plier portions apart; and

two grip members, each of them being pivoted about said pivot at one of its ends and formed with a space and an abutment portion therein so that each of said two shear portions can be received in its related space and abut against its related abutment portion to expose said two



plier portions, and each of said two plier portions can be received in its related space and abut against its related abutment portion to expose said two shear portions.

4,942,638

HAND-GUIDED, MOBILE CLEANING MACHINE

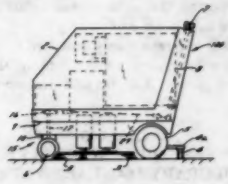
Kurt Heim, Nahe, Fed. Rep. of Germany, assignor to Hako-Werke GmbH & Co., Bad Oldesloe, Fed. Rep. of Germany

Filed Dec. 15, 1988, Ser. No. 285,046

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742648

Int. Cl.[5] A47L *11/16, 11/40*

U.S. Cl. 15—50 R **13 Claims**



1. A hand-guided, mobile cleaning machine comprising:

a frame;

a front roller assembly and a set of rear rollers each secured to the underside of the frame for movably supporting the machine;

means for driving the rear rollers;

a cleaning tool mounted on the frame for contact with the ground, the cleaning tool being disposed between the front roller assembly and rear rollers;

a handlebar mounted on the rear of the machine; and,

means operatively connecting the handlebar to the front roller assembly for allowing the operator to control the direction of motion of the machine from the rear of the machine by manipulation of the handlebar which causes rotation of the front roller assembly.

4,942,639

BULKY DUST SWEEPER

Osamu Shishido; Satoru Noguchi, and Seiji Seino, all of Shizuoka, Japan, assignors to Amano Corporation, Yokohama, Japan

Filed Oct. 25, 1988, Ser. No. 262,024

[30] Foreign Applications Priority Data Oct. 27, 1987 [JP] Japan 62-270800

Int. Cl.[5] E01H *1/04*

U.S. Cl. 15—83 **2 Claims**

1. A bulky dust sweeper comprising:

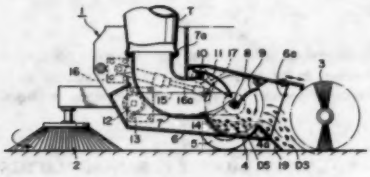
a vehicle body having side brushes at a forward end of the vehicle body for brushing up bulky dust toward the center of the vehicle body, and a main brush mounted on the bottom of said vehicle body for sweeping up the bulky

dust which has been brushed toward the center of the vehicle body by said side brushes;

a hopper on said vehicle body adjacent said main brush and positioned to receive bulky dust swept up by said main brush through a front end of said hopper;

a duct having one end connected to said hopper;

a scraper vane rotatably disposed in said hopper and drive means for rotating said scraper vane for scraping the bulky dust which has been brushed into the hopper by said main brush to the position where said duct is connected to said hopper;



a push-in flap disposed in said sweeper where said duct is connected to said hopper and reciprocal drive means connected to said push-in flap for reciprocatingly moving said push-in flap for pushing the bulky dust which has been scraped to the position where said duct is connected to said hopper by said scraper vane into and toward the other end of said duct; and

a dust collecting bag removably attached to the other end of said duct for receiving and collecting therein the dust pushed through said duct by said push-in flap.

4,942,640

AUTOMATIC ELECTRIC VACUUM CLEANER WITH TEMPORARY MANUAL OVERRIDE

Nobuhiro Hayashi, Shiga; Toshiichiro Tanaka, Youkaichi; Seiji Yamaguchi, Shiga, and Hidetoshi Imai, Youkaichi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

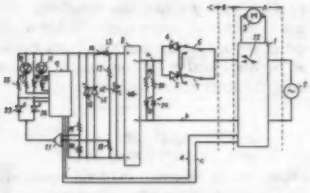
PCT No. PCT/JP88/00337, § 371 Date Dec. 1, 1988, § 102(e) Date Dec. 1, 1988, PCT Pub. No. WO88/07347, PCT Pub. Date Oct. 6, 1988

PCT Filed Apr. 1, 1988, Ser. No. 283,324

Claims priority, application Japan, Apr. 2, 1987, 62-81441

Int. Cl.[5] A47L *9/28*

U.S. Cl. 15—319 **14 Claims**



1. An electric vacuum cleaner comprising:

(a) a housing having an electric motor means for driving a suction fan;

(b) a suction nozzle for picking up dust;

(c) a suction hose including a handle portion for connection said suction nozzle to said housing;

(d) manually operable switch means provided at said handle portion of said suction hose for producing a speed command signal while said manually operable switch means is operated;

(e) detection means for detecting an amount of said dust passing through said suction hose per unit time;

(f) switching means responsive to said speed command signal by outputting said speed command signal when said speed command signal is present and by outputting an output signal of said detection means when said command signal is absent; and

(g) controlling means responsive to an output signal from said switching means for controlling a speed of said suction fan driven by said electric motor means in accordance with said output signal of said detection means in the absence of said speed command signal and for setting said electric motor means to drive said suction fan at a predetermined speed in the presence of said speed command signal.

4,942,641

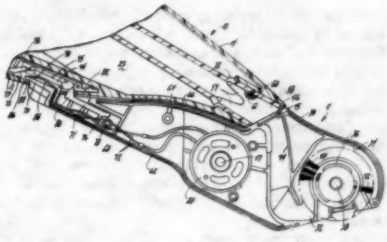
ACCESSORY BRUSH ATTACHMENT

Burton E. Gerke, Jr., Newtown, and Richard B. Kosten, West Haven, both of Conn., assignors to Black & Decker Inc., Newark, Del.

Filed Jan. 9, 1989, Ser. No. 294,616

Int. Cl.[5] A47L *5/26*

U.S. Cl. 15—338 **9 Claims**



1. An accessory brush attachment for a vacuum cleaner comprising:

a motor;

a housing having a front end and a back end, said housing enclosing said motor;

said housing having an intake aperture for reception of dirt, liquid and air drawn into said housing in response to a vacuum produced by the vacuum cleaner;

a rotatable brush disposed within said intake aperture for contacting a surface to be vacuumed;

means interconnecting said brush and said motor for allowing said motor to rotate said brush;

said housing including first means for mounting said accessory brush attachment at a first point to a canister of the vacuum cleaner, said first means comprising a tubular member removably disposed in the end of a nozzle of the canister of the vacuum cleaner; and

said housing including second means for mounted said accessory brush attachment at a second point to a housing of the vacuum cleaner.

4,942,642

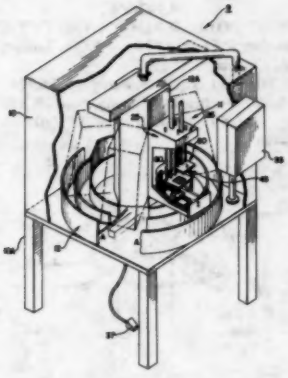
DEBONING SYSTEM AND METHOD OF USING SAME

John H. Funkhouser, II, Del Mar, and Thomas W. Todd, San Diego, both of Calif., assignors to User Friendly Foods, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 264,192, Nov. 28, 1988, which is a continuation-in-part of Ser. No. 111,106, Oct. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 622,998, Jun. 21, 1984, abandoned. This application Dec. 1, 1989, Ser. No. 444,771

Int. Cl.[5] A22C *25/16*

U.S. Cl. 17—46 **17 Claims**



1. A system for removing proximal bones from fowl wings, comprising:

means defining a small opening, said opening being smaller than the proximal end of the fowl wing;

means for moving the proximal end of the fowl wing through said opening for stripping a portion of the flesh and its covering skin from the proximal bones;

means for gripping said stripped proximal bones;

means for retracting the distal end of the fowl wing away from said opening to extend the fowl wing; and

means for pressing forcibly against the distal end of the extended fowl wing near the proximal bones to disjoint the proximal bones from the fowl wing.

4,942,643

MECHANICAL COTTONSEED DELINTER

Louis T. Kincer; Dale R. Kincer, and Denny L. Kincer, all c/o L. T. Kincer Co., 3509 Globe Ave., Lubbock, Tex. 79404

Filed Jul. 17, 1989, Ser. No. 380,332

Int. Cl.[5] D01R *1/00*

U.S. Cl. 19—44 **21 Claims**

1. A delinting machine for delinting cottonseed, comprising:

a housing;

an inlet hopper;

a plurality of delinting sections vertically spaced from each other, each of said delinting sections including,

a rotatably driven shaft having a support member fixedly connected thereto;

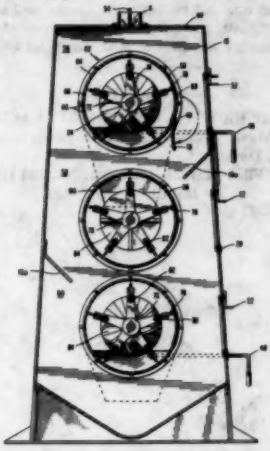
a brush member connected to said support member and rotated thereby;

a plurality of cone members fixedly connected to said driven shaft;

a screen member fixed to said machine concentric and stationary with respect to said shaft, said support member, said brush member, and said cone member, said rotating brush member brushing said cottonseed against said screen member thereby forcing lint through said screen member and off said cottonseed; and

a variably movable door member for controlling a period of time in which said cottonseed is retained in each of said delinting sections so as to remove lint therefrom;

a drive means for driving each of said driven shafts;



an air inlet control means for controlling air circulation in said machine housing; and,

a discharge duct for discharging delinted cottonseeds from said machine housing.

4,942,644

STRAP HANGER

William W. Rowley, 11524 Wilbert Rd., Chardon, Ohio 44024

Filed Mar. 18, 1985, Ser. No. 713,331

Int. Cl.[5] B65D *63/00*

U.S. Cl. 24—16 PB **6 Claims**

1. A flexible hanger strap comprising a strip of bendable material having at least one locking hole positioned centrally between the lateral edges of said strap, said hole comprising a longitudinal slot which flares open at each of its ends forming a pair of triangular enlargements the end edges of which are approximately one-half the width of said strap and normal to said longitudinal slot, both ends of said strap having an arrowhead each of which may be respectively inserted and locked into said hole forming double loops with no undue deformation or bending of the edges of said hole or said arrowheads, said arrowheads each having a width approximately equal to the width of the strap and a notched portion being slightly smaller

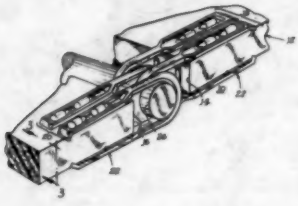
than the width of the triangular enlargements whereby when said loops are formed and said arrowheads are inserted through said hole and said notched portions are aligned respectively within each of said triangular enlargements the shoulder edges of said notched portions engage behind said triangular enlargements with the surface of said strap at said notched portions engaging the ends of said triangular enlargements.

4,942,645

FASTENER WITH INCREASED REACH-BACK

Edward C. Musil, Lyons, Ill., assignor to Flexible Steel Lacing Company, Downers Grove, Ill.

Filed May 22, 1989, Ser. No. 355,170
Int. Cl.[5] F16G *3/02*
U.S. Cl. 24—33 C **3 Claims**



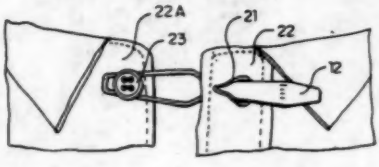
1. A belt and belt fastener assembly comprising:
a belt having a first belt end and a second belt end to be joined together,
a first set of belt fasteners comprising a plurality of belt fasteners each having upper and lower arms fastened to the first belt end at spaced locations along the first belt end, a second set of belt fasteners comprising a plurality of belt fasteners each having upper and lower arms fastened to the second belt end at spacial locations along the second belt end and intermeshed with the first set of belt fasteners,
a first set of hinge loops joining the upper and lower arms on the first set of belt fasteners,
a second set of hinge loops joining the upper and lower arms on the second set of belt fasteners with the second set of hinge loops being intermeshed with the first set of hinge loops and defining an opening,
a hinge pin inserted through said opening defined by the intermeshed loops of the respective intermeshed hinge loops to joint he hinge loops together,
outer extremity surfaces on the first set of hinge loops positioned adjacent the second belt end,
outer extremity surfaces on the second set of hinge loops adjacent the first belt end,
outer free ends on the upper and lower arms of the belt fasteners of the first and second sets of belt fasteners located at a reach back distance from the belt end,
first belt stops on one of the arms of the first set of belt fasteners being offset with respect to the hinge loops of the second belt fasteners and engaging the first belt end,
said first belt stops having belt engaging surfaces being offset with respective to the hinge loops of the second set of belt fasteners and engaging the first belt end so as not to interfere with each other during assembly and to allow the loops to move to the belt end to provide a maximum size of opening when the loops are at the first belt end,
said belt engaging surfaces on said first set being substantially aligned with the exterior hinge loop surfaces of the second set of hinge loops and having a substantial portion of the first belt stops being located inwardly of said exterior hinge loop surfaces and towards the hinge pin to maximize a reach back distance from the free ends of the arms on the first set of belt fasteners,
second belt stops on one of the arms of the second set of belt fasteners being offset with respect to the hinge loops of said first belt fasteners and engaging the second belt end so as not to interfere with each other during assembly and to allow the loops to move to the belt end to provide a maximum size of opening when the loops are at the second belt end,
said belt engaging surfaces on said second set being substantially aligned with the exterior hinge loop surfaces of the first set of hinge loops and having a substantial portion of the second belt stops being located inwardly of said first exterior hinge loop surfaces and towards the hinge pin to maximize a reach back distance from the free ends of the arms on the second set of belt fasteners.

4,942,646

SHIRT COLLAR BUTTONING DEVICE

Gabriel Sebastian, P.O. Box 891 c/o KOA, Indians Head, Saskatchewan, Canada S0G 2K0

Filed Jul. 31, 1989, Ser. No. 386,776
Claims priority, application Canada, Sep. 29, 1988, 578765
Int. Cl.[5] A44B *1/18*; B25F *1/00*
U.S. Cl. 24—40 **4 Claims**



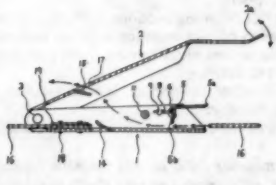
1. A shirt collar buttoning device formed from a one piece length of wire and having a front collar button engaging end and a rear handle end and comprising a planar rear handle portion of spaced apart wires diverging at the forward ends thereof and then inclining downwardly and forwardly from the transverse plane of the handle portion and diverging from one another, then extending forwardly parallel to but spaced forwardly of the handle portion in a transverse plane below the transverse plane of the handle portion and then inclining slightly upwardly and converging to terminate in a rounded closed forward end portion constituting the said front collar button engaging end, the plane of which is lower than the transverse plane of the handle portion.

4,942,647

TENSIONING BUCKLE

Peter H. Wallner, 114 Vasey Cres, Campbell A.C.T 2601, Australia

Filed Sep. 12, 1988, Ser. No. 243,515
Claims priority, application Australia, Sep. 25, 1987, PI4597
Int. Cl.[5] A44B *11/10*
U.S. Cl. 24—170 **4 Claims**



1. A buckle for tensioning belt including the combination of: overlapping U-sectioned upper and lower bodies being pivotably connected and manually leverable about each other; said lower body laterally housing, in proximal order to said pivota-

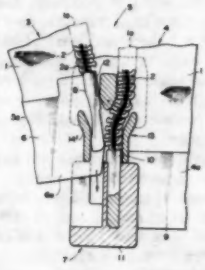
bly connected end, means to permanently attach a belt end, an upwardly protruding tongue to direct belt, a cylindrical roller, a torsional spring, a manually operated cam contacting said torsional spring; said cam allowing belt to feed between it and said lower body towards said pivotably connected end and preventing belt slipping away from said pivotably connected end, said cam having limited movement by locating in non circular holes in sides of said lower body; said upper body laterally housing; a downwards protruding tongue corresponding to said tongue in said lower body when buckle is in a closed position, a slot adjacent to said tongue, said slot and tongue edges being oriented to allow belt to pass through said slot when buckle is in a closed position and grip belt as said upper body is levered about said lower body.

4,942,648

SEPARABLE TYPE WATER-RESISTANT SLIDE FASTENERS

Hiroshi Yoshida, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 363,992
Claims priority, application Japan, Jun. 10, 1988, 63-533705
Int. Cl.[5] A41D *13/00*
U.S. Cl. 24—389 **3 Claims**



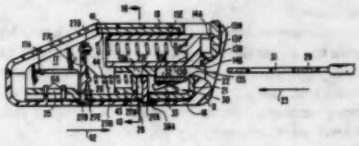
1. A separable type water-resistant slide fastener comprising a pair of fastener stringers including a pair of water-resistant stringer tapes and two pairs of rows of coupling elements each mounted along a respective one of the inner longitudinal marginal portions of and on the opposite or upper and lower surfaces of the stringer tapes; a slider movable reciprocally on and along the coupling element rows to couple and uncouple the same, the slider including an upper and a lower wing joined with each other to define a tape-passing gap therebetween; and a reinforcing strip provided on one fastener stringer to extend from beneath the lower end of the stringer tape to beneath the lowermost element; and a separable bottom-end-stop assembly including an insert pin member formed integrally to the reinforcing strip and extending from beneath the lowermost element down to a predetermined position above the lower end of the stringer tape, a socket member secured to the other fastener stringer in opposite relation to the insert pin member and having a slit in the side facing the one fastener stringer, and a socket pin member secured to the other fastener stringer to project from the socket member; the reinforcing strip having an insert-pin guide extending from the lower end of the insert pin member to the lower end of the one fastener stringer, the insert-pin guide being insertable through the gap into the slit to thereby place the slider and the socket member into coplanar relation to each other before threading the insert pin member through the slider into the socket member; and, when being fully inserted into the socket member, the insert pin member having its upper end lie higher than the upper end of the socket pin member by not less than one inter-element pitch.

4,942,649

SAFETY BELT BUCKLE

James R. Anthony, Carmel; David Merrick, Indianapolis; Ronald F. Homeier, Plainfield, and Allan R. Lortz, Carmel, all of Ind., assignors to Indiana Mills & Manufacturing, Inc., Westfield, Ind.

Continuation-in-part of Ser. No. 160,405, Feb. 25, 1988, Pat. No. 4,876,772. This application May 30, 1989, Ser. No. 357,805
Int. Cl.[5] A44B *11/25*
U.S. Cl. 24—637 **19 Claims**



1. A buckle comprising:

a body having an entrance to admit a latchable tongue;

a latch member in said body and having a latching pawl thereon;

said latch member being pivotable in said body to enable said latching pawl to move into a latching position to interfere with movement of a tongue through said entrance;

resilient means urging said pawl to said latching position;

guide means in said body defining a guideway for a release slide; and

a release slide received in said guideway and having a rest position and a release position, and normally biased to said rest position;

said release slide having ribbed surface means guidingly engaged by and slidable on a portion of said guide means for sliding movement from said rest position to said release position; and

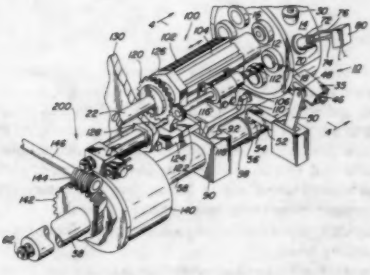
said latch member having a portion engageable by a portion of said slide when said slide is moved from said rest position to said release position to move said latching pawl out of said latching position.

4,942,650

FLUID ACTUATED METHOD AND MEANS FOR CONTROLLING A TOOL SLIDE

Richard F. Howarth, 2 Bridle La., Blue Bell, Pa. 19422

Continuation of Ser. No. 883,580, Jul. 9, 1986, abandoned. This application Jun. 2, 1989, Ser. No. 361,731
Int. Cl.[5] B23B *9/04*
U.S. Cl. 29—38 B **6 Claims**



1. In combination with a multiple spindle bar machining apparatus of the type in which an end-tool slide assembly moves along a shaft to bring machining tools into contact with

work pieces, means for controlling the movement of said end tool slide assembly along said shaft, comprising:

(a) a piston rod attached to the end tool slide assembly and parallel to said shaft;

(b) a hydraulic drive for driving said piston rod to move the end tool slide assembly along the shaft, said hydraulic drive having a servo valve controller means to control the movement of the piston rod in response to received servo signals, movement detecting means responsive to linear movement of the piston rod, and converting means for converting said linear movement into proportional rotary movement;

(c) encoder means operatively associated with said hydraulic drive to encode the rotary movement into coded electrical signal information indicating the linear movement of the piston rod; and

(d) programmable controller means for entering and storing control data representing the desired movement of the piston rod, for receiving the coded signal information from the encoder means and comparing the same to the stored control data, and for outputting an appropriate servo signal to the hydraulic controller to position the piston in accordance with the control data.

4,942,651

APPARATUS FOR ASSEMBLING A SEAT FOR USE IN AN AUTOMOBILE

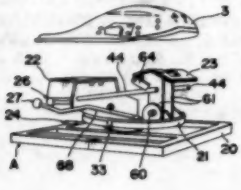
Masanori Miyamoto, Hiroshima, Japan, assignor to Delta Kogyo Co., Ltd., Hiroshima, Japan

Filed Apr. 20, 1989, Ser. No. 340,671

Claims priority, application Japan, Apr. 20, 1988, 63-54090[U]

Int. Cl.[5] B60G 7/00

U.S. Cl. 29—91.5 **8 Claims**



1. A seat cushion assembling apparatus comprising:

a rotary table which is horizontally rotatable;

first and second setting tables mounted on said rotary table and adapted to have a seat slider or a seat placed thereon, said first setting table comprising first and second plates and said second setting table having an upper surface;

a rotation locking means for locking said rotary table at a predetermined rotational position thereof;

a locking means for locking a seat cushion frame on said first setting table;

a widening/narrowing means for varying the distance between said plates of said first setting table; and

an upward/downward pivoting means for pivoting said second setting table between upper and lower set positions.

4,942,652

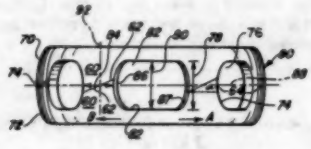
METHOD OF MAKING A CONSTANT VELOCITY JOINT CAGE

Daniel W. Hazebrook, Detroit, Mich., and Jurgen Wagner, Greensboro, N.C., assignors to GKN Automotive, Inc., Auburn Hills, Mich.

Division of Ser. No. 95,840, Sep. 14, 1987, Pat. No. 4,846,764. This application Mar. 13, 1989, Ser. No. 322,667

Int. Cl.[5] B21D 53/12

U.S. Cl. 29—898.067 **12 Claims**



1. A method for making a constant velocity joint cage having a plurality of spaced apart windows for guiding balls in a constant velocity joint, comprising the steps of:

cutting a first flat sheet metal stock into a circularly shaped multi-limbed member having a central circular aperture therein, said circularly shaped multi-limbed member further having a plurality of truncated limb radials extending radially outward therefrom, said plurality of truncated limb radials each having a distal edge which forms a predetermined angle with respect to a perpendicular of a radial through each of said plurality of truncated limb radials, said predetermined angle having a value greater than zero degrees;

pressing said multi-limbed member into an annular spherical shape to make a first half-cage member;

repeating said steps of cutting and pressing with a second flat sheet metal stock to make a second half-cage member;

positioning said first and second half-cage members in contact with each other with said truncated limb radials of said first and second half-cage members substantially aligned relative to each other;

rotating said first and second half-cage members relative to each other causing said truncated limb radials to slide relative to each other along said predetermined angle to achieve a predetermined width of said windows; and

welding said first and second half-cage members together to form a constant velocity joint cage.

4,942,653

PRODUCTION METHOD FOR A CHANNELED WALL THRUST NOZZLE

Elden L. Hawkinson, West Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 25, 1989, Ser. No. 398,552

Int. Cl.[5] B21D 53/00; B22D 19/14; B28B 21/42

U.S. Cl. 29—890.01 **18 Claims**

1. A method of forming a channeled wall thrust nozzle defining a converging-diverging thrust chamber, said method comprising the steps of:

forming a mandrel having a longitudinal converging-diverging cross-section and a transverse cross-section generally conforming respectively with the geometry of the thrust chamber to be formed, the mandrel being transversely split at a narrow diameter throat of the converging-diverging cross-section, thereby defining longitudinally separable mandrel components, said mandrel forming step further including forming an array of longitudinally extending slots in an exterior surface of the mandrel;

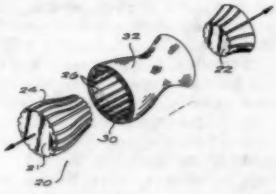
seating a plurality of channel separator ribs individually within the mandrel slots which project outwardly there-

from, thereby defining a plurality of longitudinally extending channels between the ribs;

filling the channels with a removable casting material;

mounting an outer housing shell to outboard edge margins of the channel separator ribs, thereby enclosing outboard sides of the channels;

removing the mandrel from the channel separator ribs by longitudinally separating the mandrel components;



tailoring inboard edge margins of the channel separator ribs to a selected geometry;

mounting an inner housing shell to the inboard edge margins of the channel separator ribs, thereby enclosing inboard sides of the channels; and

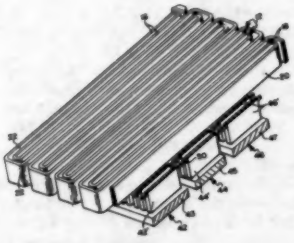
removing the casting material from the channels.

4,942,654

METHOD FOR ASSEMBLY OF SERPENTINE HEAT EXCHANGER

William D. Wright, Lyndonville, and George K. Snyder, Lockport, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed May 24, 1989, Ser. No. 356,104
Int. Cl.[5] B21D *53/02*
U.S. Cl. 29—890.035 5 Claims



1. The method of assembling a serpentine style heat exchanger comprising the steps of:

forming fins having a desired thickness,

forming a serpentine tube structure with inter-tube spacing slightly less than the fin thickness thereby impeding insertion of the fins into the inter-tube spaces,

elastically expanding the serpentine structure to enlarge the inter-tube spaces sufficiently to admit the fins,

inserting the fins into the enlarged inter-tube spaces, and

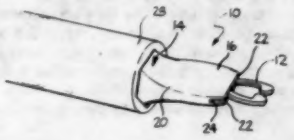
allowing the tube structure to elastically contract and grip the fins so that the fins are held under pressure of the serpentine tube.

4,942,655

E CLIP FASTENER INSTALLING TOOL

Robert Buzzelli, 29184 Martindale, New Hudson, Mich. 48165

Filed Aug. 8, 1989, Ser. No. 391,191
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—229 6 Claims



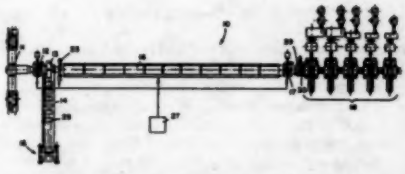
1. A fastener installing tool for holding and retaining a fastener in a predetermined position prior to installing the fastener, said tool comprising; a body having first and second end portions and a shank portion extending between said first and second end portions, said first end portion terminating in a pair of blades disposed parallel and in spaced relationship with respect to each other to define a slot therebetween for holding and retaining the fastener therein, said second end portion including a polygonal shape presenting a plurality of surfaces adapted to be supported in a tool bit holder, said assembly characterized by said shank portion presenting a pair of sloping surfaces extending between said first and second end portions and converging toward one another in the direction of said pair of blades to present a low profile at said pair of blades of said first end portion.

4,942,656

PLANT AND METHOD FOR THE TEMPERATURE-EQUALIZATION OF SLABS DOWNSTREAM OF A CONTINUOUS CASTING PLANT

Giampietro Benedetti, Campoformido, and Bruno Di Giusto, Udine, both of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed Jul. 12, 1988, Ser. No. 217,894
Claims priority, application Italy, Aug. 5, 1987, 83427 A/87
Int. Cl.[5] B21B *1/46*
U.S. Cl. 29—527.6 11 Claims



1. In a plant for continuously producing strip from a continuous casting machine, the improvement comprising a temperature-equalization plant comprising:

a temperature-equalization furnace having an inlet door and an outlet door;

rollers rotatably mounted for oscillatory movement in said temperature-equalization furnace, means for cooling said rollers, and drive means for driving said rollers to move slab material forward in the temperature-equalization furnace, said drive means including means for driving the rollers in an oscillatory movement in one angular direc-

tion and then an opposite angular direction whereby slab material is oscillated to-and-fro while being retained within the temperature-equalization furnace;

an inlet shears upstream of said inlet door of the temperature-equalization furnace; and

an outlet shears downstream of said outlet door of the temperature-equalization furnace.

9. A method for continuously producing rolled strip from slab received from a continuous casting machine, comprising shearing slab from a continuous casting plant with an inlet shears into slab segments, heating to equalize the temperature of the slab segments in a temperature-equalization furnace having an inlet door, an outlet door, and cooled drive rollers supporting the slab segments, and rolling the heated slab segments in a rolling train, the improvement wherein in the event of an obstacle in the rolling train, the slab segments from the temperature-equalization furnace not yet rolled are sheared from the rolled slab segments by outlet shears, returned to the temperature-equalization furnace and retained in the temperature-equalization furnace in to-and-fro oscillatory movement upon the cooled drive rollers until the obstacle has been removed.

4,942,657

AUTOMATIC CUTTER CHANGE TYPE SHAVING MACHINE

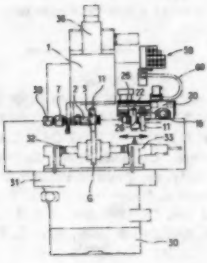
Toshihide Mihara, Amagasaki, and Yuji Odan, Suita, both of Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Amagasaki, Japan

PCT No. PCT/JP87/00145, § 371 Date Nov. 9, 1988, § 102(e) Date Nov. 9, 1988, PCT Pub. No. WO88/06944, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 10, 1987, Ser. No. 295,726

Int. Cl.[5] B23Q *3/157*

U.S. Cl. 29—568 **8 Claims**



1. An automatic cutter changing shaving machine comprising:

a support bed, a table and vertical column supported by said support bed, a pair of head stocks on said table, a cutter head mounted for vertical movement on said column by a driving motor, a plurality of rotary cutters which can be loaded to said cutter head for finishing gears, and a carriage movable toward and away from said rotary cutter head along an axis of rotation of one of said cutters by travel driving means for positioning said carriage for attachment and detachment of one of said rotary cutters relative to said cutter head,

said cutter head including a spindle having a through hole extending along the spindle axis, said spindle having a cutter abutting step spaced from an end surface at one end of said spindle and a peripheral surface defining a cutter loading portion between said cutter abutting step and said end surface, a key projecting radially from said peripheral surface, a clamp bar slidably mounted in said through hole and having an end surface near said cutter loading portion of said spindle, said clamp bar having a pin supporting hole coaxial with the spindle axis and extending internally from said end surface of said clamp bar and a clamp member carried by said clamp bar and operable to move radially outward and inward relative to said pin supporting hole in response to advance and retracting movement of said clamp bar in said through hole, means for rotating said spindle and driving means for slidably moving said clamp bar in said through hole to selectively advance and retract said clamp bar relative to said one end of said spindle, said driving means for slidably moving said clamp bar being mounted to an end of said spindle opposite to said one end of said spindle,

each of said rotary cutters having a fitting hole formed concentric with said cutter, each fitting hole including a keyway and being open at one end surface of said cutter and closed at the other end by a sealing wall of said cutter, a cutter locating end surface at said open end surface of said cutter, a pin having an axis aligned with the axis of said rotary cutter and projecting from said sealing wall of said cutter beyond said cutter locating end surface, said pin having a diameter to be slidably received in said pin supporting hole and a clamping portion adapted for engagement with said clamp member when said driving means retracts said clamp bar, and a gripping portion provided externally of said other end of said rotary cutter, said fitting hole and keyway being adapted to slidably receive said cutter loading portion and said key of said spindle with said pin slidably received in said pin supporting hole and said clamping portion in position for selective engagement and disengagement with said clamp member,

said carriage including a cutter change arm rotatably mounted to said carriage for rotation about an axis extending at a right angle relative to the direction of movement of said carriage and having first and second end surfaces which can be selectively moved to a position facing said cutter loading portion of said spindle by rotation of said cutter change arm, and chuck driving means, each of said end surfaces of said cutter change arm having a cutter phase setting instrument to maintain a constant rotational position of each cutter in a circumferential direction relative to said cutter loading portion of said spindle, a patch aligned with the spindle axis when each of said first and second surfaces is moved to said position facing said cutter loading portion, and movable chucking means selectively operable by said chuck driving means to grip and release said gripping portion of one of said rotary cutters when the rotary cutter is abutted by said patch and the constant rotational position of said rotary cutter has been determined by said phase setting instrument.

4,942,658

METHOD FOR MANUFACTURING A MAGNETIC HEAD CORE WITH A FLUX GAP HAVING A PRECISELY CONTROLLED LENGTH

Timothy W. Vandnais, Victoria; Judy M. Ekern, Edina, and Douglas J. Hennenfent, Minneapolis, all of Minn., assignors to Magnetic Peripherals Inc., Minnetonka, Minn.

Filed Nov. 30, 1988, Ser. No. 277,737

Int. Cl.[5] G11B *5/42*

U.S. Cl. 29—603 **7 Claims**

1. A method for construction of a ferrite magnetic head core having a flux gap in the magnetic flux path thereof, said head core to be cut from an O bar comprising a first ferrite piece having a bonding interface area and a second ferrite piece having a flux gap face thereon which can be aligned with the bonding interface area of the first ferrite piece to form the O bar, comprising the steps of:

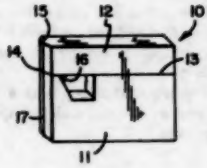
(a) depositing a hard non-magnetic layer on the second ferrite piece's flux gap face; then

(b) depositing on the hard non-magnetic material a magnetic material bondable to ferrite through the application of heat and pressure above predetermined levels; then

(c) mating the two ferrite pieces with the magnetic material

and the first ferrite piece's bonding interface area in facing and juxtaposed position;

(d) applying clamping pressure of at least the predetermined level to the ferrite pieces so as to clamp the two ferrite pieces with the bonding interface area and the deposited magnetic material face against each other; and



(e) while so clamping the ferrite pieces, heating the bonding interface area and the layer of deposited magnetic material adjacent to the bonding interface area to at least the predetermined bonding temperature to thereby bond the deposited magnetic material and the bonding interface area to each other.

4,942,659

WHEEL MOUNTING APPARATUS FOR AUTOMOBILES

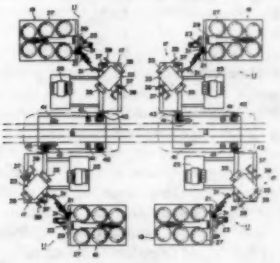
Hiromi Sakurai, Nagoya, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1989, Ser. No. 389,310

Claims priority, application Japan, Aug. 19, 1988, 63-204790; Aug. 19, 1988, 63-204791

Int. Cl.[5] B23P *21/00*

U.S. Cl. 29—705 **20 Claims**



1. An automatic wheel mounting apparatus for an automobile, and which includes a robot for positioning a wheel on a hub of the automobile and for tightening nuts onto hub studs, each hub having a separate camber angle associated therewith, said apparatus comprising:

a lifting device for lifting said hub in a direction to cancel its camber angle, a head positioned by said robot, and a measurement and positioning unit disposed on said head and having a hub center measuring device, a hub stud positioning device, and a hub inclination measuring device;

said hub center measuring device comprising vertically movable first and second measurement pieces for contact with the upper and lower parts of a circular outer peripheral surface of said hub, a laterally movable third measurement piece for contact with a side of said outer peripheral surface of said hub, and length measuring devices for measuring the amount of dislocation of said individual measurement pieces;

said hub stud positioning device comprising a hub stud positioning plate having a positioning projection for contact against an outer peripheral surface of said hub studs fixed to said hub, and an actuator for rotating said hub stud positioning plate to a predetermined angular position over an angular range greater than the pitch interval between said hub studs; and

said hub inclination measuring device having a pair of linear length measuring devices disposed laterally for measuring distance to the surface of said hub.

4,942,660

DEVICE FOR LOCATING THE IDEAL SCREWING POSITION OF BOLTS OF LARGE DIMENSIONS

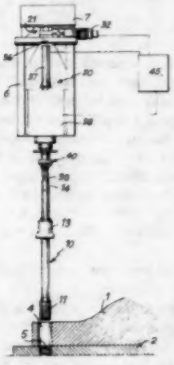
Jean-Claude Bourdonne, Le Breuil, and Alain Briand, Le Creusot, both of France, assignors to Framatome, Courbevoie, France

Division of Ser. No. 924,530, Oct. 29, 1986, Pat. No. 4,785,520. This application May 26, 1988, Ser. No. 199,076

Claims priority, application France, Oct. 29, 1985, 85 16061

Int. Cl.[5] B23P *21/00*

U.S. Cl. 29—701 **3 Claims**



1. Device for locating the ideal screwing position of a bolt (10) of large dimensions, especially for fastening a cover (1) to a vessel (2) having tapped orifices (5), said device comprising

(a) means (21) for orienting the bolt (10) in a suitable path, said means comprising a table executing intersecting orthogonal movements, said table (21) comprising a fixed bench (22) supporting a first carriage (25), said first carriage being driven in translation along an axis Y by means of a first screw (23) and a first driving nut (26), said first carriage supporting a second carriage (28), said second carriage being driven in translation on an axis X orthogonal relative to the axis Y by means of second a screw (27) and a second driving nut (30);

(b) a servo-controlled weight-compensating system (37) connected to said bolt-orienting means by an articulated connection (36);

(c) a reversible and variable-speed screwing system (38);

(d) a torque limiter (40) set at a disengaging torque corresponding to a maximum screwing torque;

(e) a member (39) gripping the bolt (10), making it possible to exert a driving torque in either direction and an axial force on said bolt; and

(f) a programmable auto-control unit (45) for controlling the device as a whole.

4,942,661

APPARATUS FOR PERFORMING THE REMOTELY-MANIPULATED INSTALLATION AND REMOVAL OF DETACHABLE CONDUIT UNITS

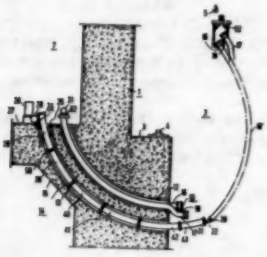
Ernst Höger, Karlstein, and Eberhard Obenauf, Offenbach, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed May 2, 1989, Ser. No. 346,471

Claims priority, application Fed. Rep. of Germany, May 5, 1988, 3815357

Int. Cl.[5] B23P *19/04*; G21C *19/16*

U.S. Cl. 29—723 11 Claims



1. In a facility having a partition wall separating a first space from a second space, said partition wall defining a through channel between said spaces for accommodating a pass-through conduit unit of a predetermined length therein, and an apparatus for performing a remotely-manipulated installation and removal of the pass-through conduit unit into and out of said channel from one of said spaces, the apparatus comprising:

a feed assembly including a plurality of segments rigidly attachable one to another to form an elongated body in the channel, with each of said segments having a predetermined length;

each two mutually adjacent ones of said segments defining an attachment interface;

releasable attachment means at each of the interfaces and on each of the segment for releasably attaching each two mutually adjacent ones of said segments to each other to hold said segments together as said elongated body;

coupling means for releasably coupling the conduit unit to said feed assembly;

drive means arranged on each one of said segments; a drive unit engaging said drive means for moving said feed assembly in said channel so as to displace and guide said conduit unit along said channel; and,

transport means arranged at a location in said one space and facing toward an end of said conduit unit for holding and remotely manipulating said conduit unit as the conduit unit is installed and removed from said channel.

4,942,662

ADJUSTABLE ARCUATE RAZOR HEAD

Allan F. Radcliffe, 12459 Floresta Ct., San Diego, Calif. 92128

Filed Jan. 17, 1989, Ser. No. 298,033

Int. Cl.[5] B26B *21/18, 21/56*

U.S. Cl. 30—49 8 Claims

1. A safety razor with means for receiving and bending at least one razor blade arcuately longitudinally wherein the means for receiving and bending comprises:

a. a handle having a longitudinal axial circular bore;

b. a bottom section of the bore having a portion of enlarged diameter;

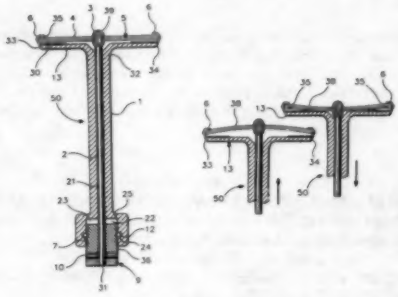
c. the enlarged diameter bore having a circumferential groove on an inside circumference;

d. a razor blade support plate to hold at least one razor blade and with a port in a body of the plate to receive a blade holding fixture;

e. a circular rod extending through the axial bore of the handle having the blade holding fixture on a first end of the circular rod to engage and hold the razor blade support plate and at least one blade and having a cylindrical finger grip fixture attached to a second end of the circular rod;

f. a razor head on a first end of the handle with a spring-loaded clip on a first end and on a second end of the razor head to hold at least one razor blade and the razor blade support plate;

g. a slot in the spring-loaded clip with a width of the slot sufficient to receive the razor blade support plate and at least one razor blade;



h. a portion of the cylindrical finger grip fixture slidably disposed within the enlarged bore of the handle;

i. the finger grip fixture having three axially spaced circumferential grooves on the outside circumferential surface; and

j. a compressive ring seating in the circumferential groove on the inside circumference of the enlarged diameter bore of the handle to provide a detenting action as the movement of the circular rod in the bore of the handle allows the ring to engage one of the three circumferential grooves on the outside circumference of the finger grip fixture providing three axial stops which causes the longitudinal edge of the razor blade support plate and at least one razor blade placed thereon to assume a concave, convex and straight configuration according to the groove in the finger grip fixture selected.

4,942,663

SHEATH

Edward D. Ray, Sr., 1428 N. Bellview, Mesa, Ariz. 85203

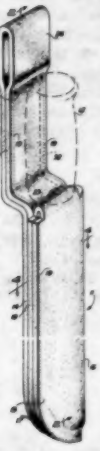
Filed Apr. 21, 1989, Ser. No. 341,768

Int. Cl.[5] B26B *3/06, 3/00, 29/02*; A45F *5/00*

U.S. Cl. 30—151 8 Claims

1. A knife sheath comprising elongated front and back panels made of flexible material, said panels being joined along their longitudinal edges and providing an opening at one end for insertion of a knife blade between the panels, and an elongated,

flexible magnetic strip carried at the inner face of one of said panels for engagement with a knife blade inserted into the



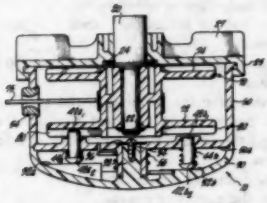
sheath, said magnetic strip being nearly coextensive in length with said panel.

4,942,664

STRING TRIMMER WITH AUTOMATIC FEED

Leonid Zatulovsky, Arleta, Calif., assignor to Allegretti & Company, Chatsworth, Calif.

Filed May 26, 1988, Ser. No. 198,992
Int. Cl.[5] B26B 7/00; A01G 3/06
U.S. Cl. 30—276 **10 Claims**



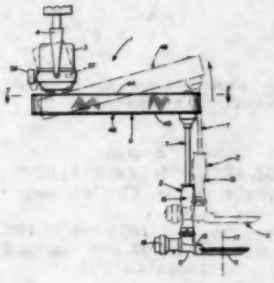
1. A string trimmer comprising:
a body member rotatably positionable about a main shaft, said body member generally having a cylindrical shape with a first closed end, a second open end, and a side wall having an aperture therein;
a spool for holding line, said spool connectable to a main shaft and generally coaxially positioned within said body member inwardly of said closed end such that the line may be threaded through the aperture in said side wall;
a cap member rotatably connected to and positioned outward of said closed end of said body member; and
means for releasing a length of line through rotation of said body member relative to said spool in response to temporarily restrained rotation of said cap member relative to said body member,
wherein said cap member has an inward face adjacent said closed end of said body member and an outward face, said inward face having a series of ramps, wherein said means for releasing a length of line comprises
rotational biasing means between said body member and said cap member for rotationally biasing said cap member to a first position relative to said body member,
a plurality of stops radially spaced about an outward face of said spool,
a first pin and a second pin extending through apertures in the closed end of said body member, each of said pins having a first end for contacting the stops on said spool and a second end for contacting the ramps on said cap, and
means for biasing each of said pins against the ramps of said cap.

4,942,665

MEAT TRIMMING KNIFE AND DRIVE SYSTEM THEREFORE

Timothy J. McCullough, 833 Aurora Rd., Vermilion, Ohio 44089

Filed Sep. 19, 1989, Ser. No. 409,571
Int. Cl.[5] A22C 17/04
U.S. Cl. 30—276 **22 Claims**



1. A hand manipulated meat trimming knife for removal of meat from bones including:
(a) a blade holder attachment member;
(b) a blade holder mounted on the attachment member;
(c) a ring-shaped cutting blade rotatably mounted on the blade holder and having a circumferential cutting edge rotatable about a central rotational axis of the blade;
(d) an elongated handle mounted on the attachment member having a longitudinal axis extending generally parallel to and spaced from the rotational axis of the blade; and
(e) driving means in the handle drivingly connected to the cutting blade for rotatably driving said blade.

4,942,666

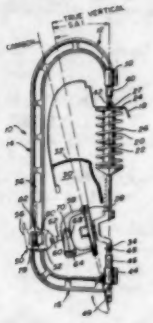
APPARATUS FOR MEASURING CAMBER, CASTER AND STEERING AXIS INCLINATION OF A VEHICLE

John T. Wickmann, Omemee, and Phillip Carlton, Bowmanville, both of Canada, assignors to Chart Industries Ltd., Pickering, Canada

Filed Nov. 28, 1989, Ser. No. 442,150
Int. Cl.[5] G01B 5/25, 5/255
U.S. Cl. 33—203.18 **10 Claims**

1. An apparatus for enabling simultaneous readings of the camber, caster and steering axis inclination of steering components that form part of a front wheel suspension of a vehicle equipped with a hub assembly, the steering components including upper and lower steering pivots defined along a steering axis; said apparatus comprising:
an upright having an upper part and a lower part;
first engaging means at said upper part adapted to engage said upper steering pivot;
second engaging means at said lower part adapted to engage said lower steering pivot;
third engaging means having a first part adjustably mounted on said upright and a second part adapted to bear against said hub assembly;
first gauge means mounted on said second part for giving a camber reading of the hub assembly;

second gauge means mounted on said upright for giving a caster reading of the steering axis; and



third gauge means mounted on said upright for giving a steering axis inclination reading.

4,942,667

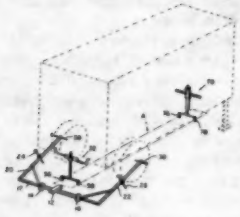
PORTABLE AXLE AND FRAME ALIGNMENT TOOL

Jerald C. Fournier, Columbia City, Ind., assignor to Axle-Tru, Inc., Columbia City, Ind.

Continuation of Ser. No. 121,853, Nov. 17, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 370,054

Int. Cl.[5] G01B *11/27*

U.S. Cl. 33—288 **17 Claims**



1. An apparatus for detecting defects in the alignment of an axle with a frame of a vehicle, and for detecting deformities in said frame, said apparatus comprising:

a first target assembly attachable to an underside of said vehicle, said first target assembly comprising a first generally vertical member having first and second ends, means for attaching the first end of the vertical member to the underside of the vehicle, a first generally horizontal member attached to the second end of the first vertical member, and at least two targets mounted on said first horizontal member and spaced apart on a first line substantially transverse to a longitudinal axis of the vehicle, and spaced an equal vertical distance from said underside;

a second target assembly attached to said underside, said second target comprising a second generally vertical member having first and second ends, means for attaching the first end of the vertical member to the underside of the vehicle, a second generally horizontal member attached to the second end of the second vertical member, and at least two targets spaced apart on a second line substantially transverse to said longitudinal axis of the vehicle, and each spaced said vertical distance from said underside, said second target assembly targets each having an opening;

a light source means for generating a beam of light and for projecting said beam through the opening in one of the second target assembly targets when the light source means is in a first position, and wherein said light source means is movably positionable along a third line substantially transverse to said longitudinal axis of the vehicle to a second position such that said generated beam of light in its two positions defines a reference plane as said light source means is moved from said first to said second position to project the light beam through the openings in the second target assembly targets; and

gauge means, positionable between the underside of the vehicle and the reference plane, for indicating the existence of and degree of vertical deformation of the underside of the vehicle.

4,942,668

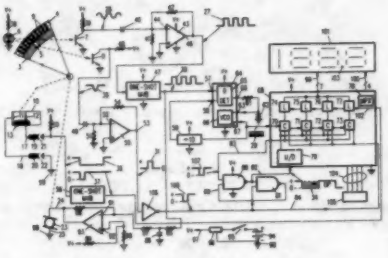
DIGITAL INCLINOMETER

Robert C. Franklin, Los Gatos, Calif., assignor to Zircon International, Inc., Campbell, Calif.

Filed May 11, 1988, Ser. No. 192,809

Int. Cl.[5] G01C *9/06*

U.S. Cl. 33—366 **4 Claims**



1. A digital inclinometer comprising:

encoding means for indicating rotation rotated by a direct current motor;

means for sensing a certain orientation fixed to the encoding means; and

means for counting the rotation of the encoding means between a particular position of the orientation sensing means and the certain orientation of the orientation sensing means;

wherein the counting means includes;

an index on the encoding means;

means for sensing the index; and

means for measuring digitally the angular distance that the encoding means rotates between the detection of the index by the index sensing means and the certain orientation of the orientation sensing means;

wherein the measuring means includes;

transparent angular index marks forming a part of the encoding means, light-generating means, and light-responsive means for generating an electronic signal in response to light transmitted by the light-generating means through the portion of said encoding means having the angular index marks;

a first comparator having two input terminals with the first terminal electrically connected to ground and the second terminal electrically connected to receive the signal generated by the light-responsive means, to produce a first comparator output signal on an output lead;

a first multivibrator having an input terminal electrically connected to the first comparator output lead to produce a first multivibrator output signal on an output lead;

a second comparator having two input terminals with the first terminal electrically connected to ground and the second terminal electrically connected to an output lead of the index sensing means, so as to produce a second comparator output signal on an output lead;

a second multivibrator having an input terminal electrically connected to an output lead of the orientation sensing means, so as to produce a second multivibrator output signal on an output lead;

motor control means electrically connected to the output lead of the first multivibrator, to control the motor speed;

phase-locked loop means electrically connected to the output lead of the first multivibrator to increase angular resolution and having an output lead;

an up/down counter having three input terminals electrically connected respectively to the output lead of the phase-locked loop means, to the second multivibrator output lead, and to the second comparator output lead, to produce an output signal on an output lead; and

a digital display electrically connected to the counter output lead to visually display the measured angular distance.

4,942,669

DIPSTICK LOCATOR AND WIPER CONSTRUCTION FOR AUTOMOBILES

Edwin F. Schnedl, 614 South View Ter., Alexandria, Va. 22314

Filed Oct. 3, 1989, Ser. No. 416,583

Int. Cl.[5] G01F *23/04*

U.S. Cl. 33—725 **6 Claims**

1. In a dipstick locator and wiper construction for automobiles, the combination comprising:

a. an adaptor to be attached externally of a dipstick tube into which said dipstick is inserted, said adaptor having

i. a lower section for frictional engagement with the exterior of said dipstick tube,

ii. an intermediate section to accommodate a cap member positioned at the upper end of said dipstick,

iii. and an upwardly extending funnel-shaped top section serving as an easy locator for the lower end of said dipstick,

(a) said funnel-shaped top section terminating in an upper surface from which at least one wiper slot extends downwardly therefrom providing means to wipe residual oil from said dipstick.

4,942,670

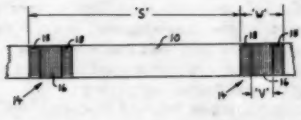
ADHESIVE TEMPLATE TAPE

Harold Brandt, 925 Dogwood Cir., Waynesboro, Va. 22980

Filed Jul. 20, 1989, Ser. No. 382,266

Int. Cl.[5] G01B *3/10*

U.S. Cl. 33—494 **27 Claims**



1. An adhesive template tape comprising:

an obverse surface;

a reverse surface provided with a self-adhesive layer disposed thereupon;

a plurality of marked fields upon and in said obverse surface, said marked fields being equidistantly spaced longitudinally along said obverse surface, said marked fields having substantially identical longitudinal extents; and

spaces separating said marked fields longitudinally;

said marked fields being provided with highcontrast marking to effect distinct visual contrast relative to said spaces, wherein said self-adhesive layer provides for adhesion of the adhesive template tape to ordinary building construction materials, wherein said marked fields in combination with said spaces serve as visual templates for establishing proper locations and spacing of construction members during erection thereof along and on other construction members when the adhesive template tape is adhesively affixed thereto, so that superpositioning and substantially aligning said construction members upon the adhesive template tape in substantial visual registration correspondence with the markings in said marked fields established proper locations for attachment of said construction member to said other construction members;

wherein said marked fields are compound fields, each said compound field comprising a center field and two substantially identical side fields, each of said substantially identical side fields being disposed along and adjoining a transverse boundary of said center field, said center field being provided with visually constrasting markings relative to said side fields, said center fields extending longitudinally by substantially identical lengths, said compound fields providing a dual purpose utility for aligning of said construction members having a thickness size corresponding to the longitudinal extent of said compound field or, alternately, a thickness size corresponding to the longitudinal extent of said center field.

4,942,671

PROBE HEAD MOUNT FOR A DEFLECTABLE PROBE OR THE LIKE

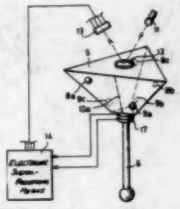
Eckhard Enderle, Aalen-Dewangen; Hans-Peter Aehnelt, Oberkochen, and Dieter Kaufmann, Heidenheim, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Nov. 30, 1988, Ser. No. 277,710

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1988, 3824549

Int. Cl.[5] G01B *11/24*

U.S. Cl. 33—559 **23 Claims**



1. A mount for a displaceable probe part in a coordinate-measuring instrument, and wherein the mount comprises a fixed component and movably mounted component, one of which components having substantially the shape of a truncated pyramid having a central longitudinal axis, the movably mounted component being force-displaceable into a seated zero position with respect to the fixed component; and said seated position being determined by at least six locations which are spaced axially and radially from each other with respect to the longitudinal axis of the truncated pyramid (5,7;55,57;65,67).

4,942,672

METHOD OF MEASURING THE HEIGHT OF BURRS AND A BURR MEASURING HEAD

Kunio Yoshida, Gotenba, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 387,747
Claims priority, application Japan, Aug. 12, 1988, 63-200634
Int. Cl.[5] G01B 5/18
U.S. Cl. 33—832 7 Claims

1. A method of measuring the height of burr by a measuring head provided with a measuring bit having a knife-edged tip, and attached to the movable measuring member of a displacement measuring device, comprising the steps of;

placing said measuring head in such a manner that said knife-edged tip is in parallel contact with the bottom sade of said burr;

reading a scale marked by a pointer of said displacement measuring device;

lifting up said measuring head;

turning said measuring head so that said knife-edged tip extend substantially perpendicularly to the edge of said burr;

placing said measuring head so that said knife-edged tip is in contact with said edge of said burr; and

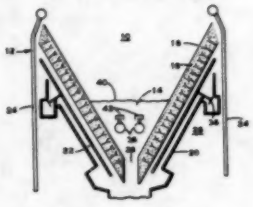
reading again scale marked by said pointer of said displacement measuring device.

4,942,673

SINTERING PREVENTION IN STAGNANT ZONES OF FLUID BED BOILERS

Rick L. Dellinger, Canal Fulton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 18, 1988, Ser. No. 233,391
Int. Cl.[5] F26B 3/08
U.S. Cl. 34—10 16 Claims



8. An anti-agglomeration method for preventing the sintering of ash-costed particles comprising the steps of:

(a) collecting ash and ash-costed particles in a storage chamber having at least one lower discharge opening therein, some of said particles containing potaseium and/or sodium compounds;

(b) venting a heated fluidizing medium into said storage chamber adjacent to but not directly above said discharge opening;

(c) fluidizing said ash and ash-costed particles collected within said storage chamber by means of said fluidizing medium; and

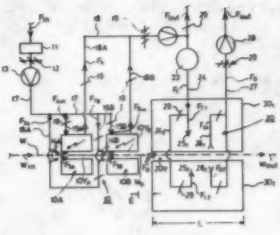
(d) maintaining the separation of said particles containing potassium and/or sodium compounds, which lower the surface eutectic point of said particles, to prevent particle-to-particle interaction and thereby preventing their agglomeration.

4,942,674

METHOD IN THE DRYING OF A PAPER WEB OR EQUIVALENT

Markku Karlsson, Turku, Finland, assignor to Valmet Paper Machinery Inc., Finland

PCT No. PCT/FI88/00078, § 371 Date Jan. 24, 1989, § 102(e) Date Jan. 24, 1989, PCT Pub. No. WO88/09845, PCT Pub. Date Dec. 15, 1988
PCT Filed May 24, 1988, Ser. No. 313,133
Claims priority, application Finland, Jun. 4, 1987, 872504
Int. Cl.[5] F26B 7/00
U.S. Cl. 34—18 8 Claims



1. A method for contact-free drying of a paper or board web, said method comprising the steps of:

passing said web first through an infrared drying gap bound by two infrared drying units wherein at least one of said infrared drying units contains means for circulating cooling air such that substantially none of said cooling air passes into said infrared drying gap;

then passing said web through a flotation web drying gap bound by two flotation web drying units while simultaneously passing said cooling air from said at least one of said infrared drying units into at least one of said flotation web drying units and then into said flotation web drying gap.

4,942,675

APPARATUS AND METHOD FOR REGULATING THE PROFILE OF A PAPER WEB PASSING OVER A YANKEE CYLINDER IN AN INTEGRATED IR-DRYER/YANKEE HOOD

Hans Sundqvist, Turku, Finland, assignor to Valmet Paper Machinery, Inc., Helsinki, Finland

Filed Mar. 7, 1989, Ser. No. 319,679
Claims priority, application Finland, Mar. 8, 1988, 881070
Int. Cl.[5] F26B 3/00
U.S. Cl. 34—23 22 Claims

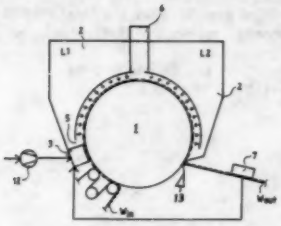
1. A method of regulating the profile of a paper web passing over a Yankee cylinder in an integrated IR-dryer Yankee hood having lateral end portions and a gap between the hood and the cylinder and through which an amount of outside air is leaking into said hood, said method comprising:

introducing cooling air into said IR-dryer;

heating said air in said dryer;

removing heated air from said dryer and passing said air to said end portions of said Yankee hood; and

directing said heated air at said end portions into the gap formed between said hood and said Yankee cylinder for



reducing the amount of outside air leaking into said hood through said gap.

4,942,676

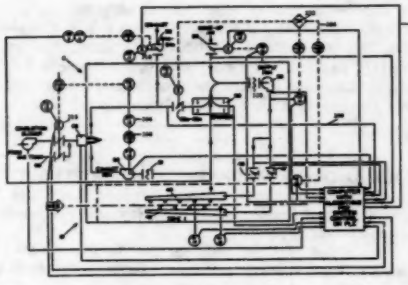
CONTROL SYSTEM FOR AIR FLOTATION DRYER WITH A BUILT-IN AFTERBURNER

Richard J. Wimberger, DePere; Donald L. Wickesberg, Neenah, and Richard A. Carman, Green Bay, all of Wis., assignors to W. R. Grace & Co.-Conn., Lexington, Mass.

Filed Jun. 7, 1988, Ser. No. 203,129

Int. Cl.[5] F26B *21/06*

U.S. Cl. 34—51 **23 Claims**



1. Control system for an air flotation dryer for vaporizing hydrocarbons from a web of material having an afterburner including an enclosure containing internally supported opposing air bars supplied by a plenum, said control system comprising:

a. means about air bars for monitoring pressure in said plenum and a hot air return damper connected to said plenum;

b. means in said afterburner for monitoring temperature in a combustion chamber, and a variable speed exhaust fan connected to supply air to said combustion chamber;

c. computer means connected to said combustion chamber temperature monitoring means and said plenum pressure monitoring means; and

d. algorithm in said computer means for controlling exhaust fan speed for said enclosure, for controlling position of an exhaust damper on said enclosure, for controlling plenum pressure, controlling burner firing rate of said afterburner, and for controlling position of said hot air return damper.

4,942,677

SHOE, ESPECIALLY SPORT SHOE OR SHOE FOR MEDICAL PURPOSES

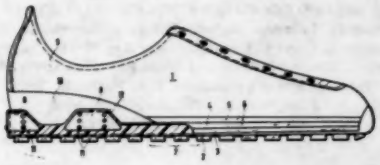
Udo Flemming, Erlangen, and Willi Bauer, Herzogenaurach, both of Fed. Rep. of Germany, assignors to PUMA Aktiengesellschaft Rudolf Dassler Sport, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,484

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734205

Int. Cl.[5] A43B *13/28, 21/26*

U.S. Cl. 36—27 **21 Claims**



1. Shoe, especially a sport shoe or shoe for medical purposes, having an upper and a sole formed of an outsole and a midsole disposed between the outsole and the upper as well as an exchangeable adjustment insert means for adjusting at least one of the height and damping characteristics of the sole at least in a heel area thereof, wherein the outsole is separable from the midsole along at least a portion of the length of the sole in an area extending at least from an arch area rearward to a heel end of the shoe, and comprising a detachable fastening means for attaching the outsole to the remainder of the shoe in said area, wherein said adjustment insert means is formed of a flexible material and is selectively inserted in a space formed between the midsole and the outsole when the outsole is separated from the midsole, and wherein said detachable fastening means comprises means for attaching the outsole to the remainder of the shoe with a variably settable spacing therebetween.

4,942,678

FOOTWEAR

Jerry F. Gumbert, P.O. Box 02011, Columbus, Ohio 43202-2011

Continuation-in-part of Ser. No. 112,689, Oct. 22, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 229,826

Int. Cl.[5] A43B *1/00*

U.S. Cl. 36—102 **8 Claims**

1. Footwear comprising:

a hollow shell having an opening in the upper rear portion thereof through which a foot may be inserted,

said shell having a median line around the perimeter of the shell dividing the shell into substantially equal upper and lower masses,

an elastic band for drawing said shell against the foot contour, said band having plural connections to said shell,

the band connections in the area of the ankle being below said median line,

the band connections fore and aft of said ankle area being above said median line,

whereby the lower portions of said shell on each side of the

ankle area are drawn upwardly, and the upper portions of the footwear are drawn toward each other.

4,942,679

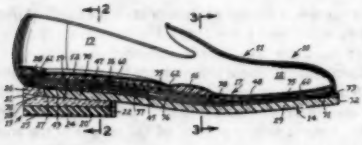
STYLED COMFORT SHOE CONSTRUCTION

Michael D. Brandon, Smyrna; Robert A. Dorris, Hermitage; Robert T. Garrett, Hendersonville; Roy N. Helton, Smyrna; Don G. Roney, Madison, and James R. Vinson, Clarksville, all of Tenn., assignors to Genesco, Inc., Nashville, Tenn.

Filed Feb. 21, 1989, Ser. No. 313,168

Int. Cl.[5] A43B *13/37, 13/40, 13/18*

U.S. Cl. 36—102 **19 Claims**



1. In a shoe construction:

(a) a heel member having a top surface, a bottom surface, a front edge portion, and styled side and rear surfaces,

(b) an elongated flexible, resilient outsole member having a top face, a bottom surface, forepart and backpart portions and outside edge portions which are co-extensive with said side surfaces of said heel member,

(c) said backpart portion of said outsole member being secured to said top surface of said heel member,

(d) a styled upper having an inturned bottom marginal portion secured flush against said top surface of said outsole member adjacent said outside edge portions of said outsole member, said bottom marginal portion defining an elongated cavity above said outsole member,

(e) an elongated filler member of flexible foam material seated within and occupying substantially the entire space within said cavity, said filler member being highly resilient and water absorptive,

(f) an elongated insole member having forepart, backpart and intermediate portions top and bottom surfaces, and marginal edge portions secured on top of said inturned bottom marginal portion of said upper,

(g) said backpart portion of said insole member being substantially rigid and said forepart portion of said insole member being flexible,

(h) a resilient heel cushion member secured on top of said backpart portion of said insole member,

(i) an elongated resilient socklining member comprising an elongated flexable, synthetic foam material substantially coextensive with said insole member and having a forepart portion, a backport portion, and an intermediate ball area, said backpart portion being secured to the top of said heel cushion member,

(j) said backpart portion of said socklining member including elongated grooves separation said backpart portion into a central portion and a pair of lateral portions, the thickness of said lateral portions being slightly greater than the thickness of said central portion, said backpart portion having the general shape of the backpart portion of the wearer's foot.

4,942,680

SKI BOOT

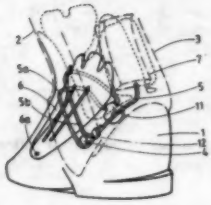
Cristiano Benetti, Postioma/TV, Italy, assignor to Lange International S.A., Switzerland

Filed Aug. 29, 1989, Ser. No. 399,856

Claims priority, application Switzerland, Nov. 24, 1988, 4364/88

Int. Cl.[5] A43B *5/04*

U.S. Cl. 36—119 **4 Claims**



1. A ski boot formed of a lower part (1) in the form of a shell, comprising the sole and surrounding at least the foot and the heel, and a shank formed by a front part (2) and a rear part (3) whereof at least the rear part (3) is articulated on the lower part (1) about a transverse pivot (4), and comprising diagonal gripping means formed by a pressure distributor (6) situated within the boot, at the level of the instep, and a stretcher device (7) mounted at the back of the boot, on said articulated rear part (3) of the shank, in order to exert a traction on the pressure distributor towards the heel by means of at least one cord (5) passing over said distributor and guided by guide means disposed laterally on the boot in order to orient the action of the cord on the distributor towards the heel, wherein the cord (5) forms a loop passing, on one side of the boot both below and above the pivot of articulation (4) of the rear part of the shank, substantially at the same distance from this pivot, and, on the other side of the boot freely through a return device (11) fixed to the inside of the shell, in a manner such that during flexion of the shank of the boot the traction exerted by the cord on the distributor is virtually unchanged.

4,942,681

FOOT RETENTION APPARATUS FOR A SKI BOOT

Louis Benoit, Frangy, and Bernard Nerrinck, La Balme De Sillingy, both of France, assignors to Salomon, S.A., Annecy Cedex, France

Filed Mar. 23, 1989, Ser. No. 327,896

Claims priority, application France, Mar. 29, 1988, 88 04483

Int. Cl.[5] A43B *5/04*

U.S. Cl. 36—119 **19 Claims**

1. A ski boot having a rigid shell comprising:

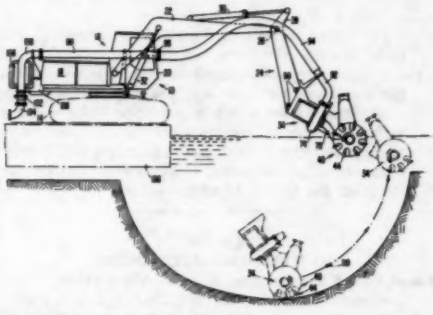
a foot retention system positioned within the interior of the rigid shell, said foot retention system having at least one foot maintenance element for at least partially surrounding a foot, said foot maintenance element being connected at one end to the boot in the plantar support zone of the foot and at the other end to an activation means for modifying the position of the maintenance element against the foot, said foot maintenance element comprising at least two flexible elements which extend transversely to the longitudinal axis of the boot and between the rigid shell and the foot in the zone of the forefoot, said flexible elements being spaced apart by a distance so as to straddle a predetermined portion of the foot.

4,942,682

DREDGING MODULE FOR USE WITH CONVENTIONAL BACK HOE APPARATUS

Alexander W. K. McDowell, Annapolis, Md., assignor to Ellicott Machine Corporation, Baltimore, Md.

Filed Jul. 13, 1989, Ser. No. 379,194
Int. Cl.[5] E02F *3/32*
U.S. Cl. 37—66 **6 Claims**



1. A dredging module for attachment to conventional back hoe apparatus of the type comprising a mobile chassis, a full revolving base, a boom having an inner end pivotally connected to said base, and power means for controlling said boom and base, said module comprising a unitary body having front and rear ends, a dredge cutter wheel rotatably supported at the front end of said body, a hopper carried by said body positioned to receive therein spoil dredged by said cutter wheel, a suction pump carried by said body, suction pipe means connecting said hopper to the inlet of said suction pump, said suction pump including outlet means for connection to a dredge pipe, first motive means carried by said body and operatively connected to said cutter wheel for driving the same, second motive means, separate from said first, carried by said body and operatively connected to said pump for driving the same, and means for releasably connecting said body to conventional back hoe apparatus, said releasable connecting means including means carried by said body for releasably connecting said body to a back hoe stick.

4,942,683

SHIRT LETTERING AND ILLUSTRATING FORM

Darl Lawson, 4630 Chrome Ridge Ct., Placerville, Calif. 95667

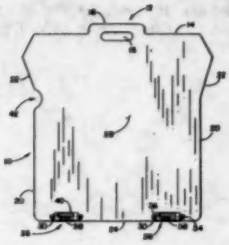
Filed Aug. 31, 1989, Ser. No. 401,104
Int. Cl.[5] D06C *3/08*; A41H *5/00*
U.S. Cl. 38—102.91 **30 Claims**

1. A form for lettering and illustrating shirts comprising, in combination:

a. a stiff, generally rectangular sheet, one edge of said sheet having a handle;

b. an arm tab projecting from each of two edges perpendicular to said edge having said handle, said tabs being adjacent said edge having said handle; and,

c. means fixed adjacent an edge opposite said edge having said handle for retaining a shirt in a taut posture over said



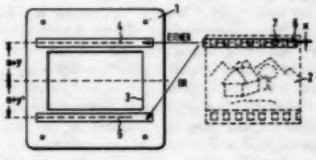
sheet, said means being oriented to open inward toward said edge having said handle.

4,942,684

SLIDE MOUNT FOR PERFORATED FILMS

Eckhardt Oehmichen, Mannspergerstrasse 96, D-7000 Stuttgart 75, Fed. Rep. of Germany

Filed Aug. 8, 1988, Ser. No. 229,232
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1987, 3726157
Int. Cl.[5] A47G *1/06*; G09F *1/12*
U.S. Cl. 40—152 **11 Claims**



1. A slide mount for a single frame of film having two sets of edge perforations whose respective centers are at a nominal distance from the longitudinal centerline of the film, said mount comprising

two complementary plastic frame parts, each defining a rectangular window centered about a longitudinal centerline of the slide mount, said frame parts being adapted to be closed together to clamp the film between said two frame parts to thereby define a mounting frame having one or more longitudinally-oriented grooves adjacent one or more opposing longitudinally extending edges of the window, and

a single boss strip which is removably insertable into said one or more grooves in at least two alternative predetermined positions relative to said mounting frame, said single boss strip having a plurality of bosses for securing the film thereon via the perforations at one edge thereof,

wherein in at least one of said two alternative positions, the distance of the bosses from the longitudinal centerline of the window is different than said nominal distance, and

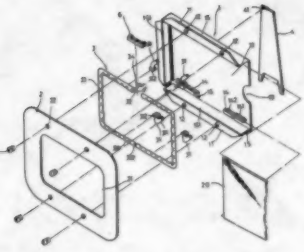
wherein when said single boss strip assumes different ones of said two alternative positions and is secured to a corresponding one of said two sets of edge perforations, the single boss strip locates the longitudinal centerline of the film in respective different predetermined vertical positions relative to the longitudinal centerline of the window.

4,942,685

LIGHT ILLUMINATED PHOTO FRAME

Ling-Yung Lin, Taipei, Taiwan, assignor to New Fei Lien Ent. Co., Ltd., Taipei, Taiwan

Filed Sep. 19, 1989, Ser. No. 409,305
Int. Cl.[5] G09F *13/00*; A47G *1/00*
U.S. Cl. 40—152.2 **3 Claims**



1. A light illuminated photo frame comprising: a front cover made of plastics, ceramics, acrylic resin, metal or wood and having a central opening for the exposition of a photograph received in said photo frame; a supporting frame having a front face with three sides thereof provided with a flange respectively consisting of a vertical wall and an outward extended horizontal fold on which a number of holes is disposed so that said front cover can be fastened thereto either by screws or by glue, a battery box integrally disposed on the rear side of said supporting frame and with a CDS light control means disposed thereon and in operative relation with LED light bulb means so as to permit switching said LED light bulb means on and off automatically by the intensity of external light, an adaptor jack disposed on said battery box, a supporting leg adapted for erecting said photo frame, a pair of slots in orthogonal relation with each other being disposed on the rear side of said supporting frame, the top end of said supporting leg being in selective engagement with one of said slots so as to permit the disposition of said photo frame to vary, and a number of guiding units secured to said front face of said supporting frame for fixing a photograph and a piece of transparent glass or the like in place; each said guiding unit being provided with a first flange and a second flange which are spaced vertically and horizontally at a slight distance with each other; at least two of said guiding units being disposed in alignment with each other at one side of said front face so as to permit the photograph and the glass to be simultaneously fixed in place by said first and second flanges reflecting surfaces on the flanged sides of said front face in place to receive light from said LED light bulb means and reflect same toward the place in the photo frame where a photo may be exposed, whereby said light bulb means produces illumination light which is delivered around the photo frame so that the photograph disposed in said photo frame can be seen in the dark.

4,942,686

PORTABLE DISPLAY SYSTEM

Matthias D. Kemeny, 1625 SW. Westwood Ct., Portland, Oreg. 97201

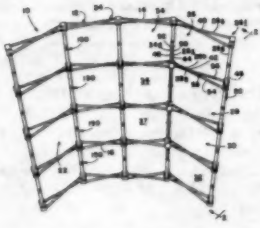
Continuation-in-part of Ser. No. 226,292, Jul. 29, 1988, Pat. No. 4,888,895. This application Jul. 31, 1989, Ser. No. 386,944
Int. Cl.[5] G09F *15/00*
U.S. Cl. 40—610 **24 Claims**

1. A portable display system comprising:

a collapsible rectangular frame, having a top, a bottom, opposed, spaced apart sides, and a front face and a rear face, including

a plurality of rectangular box units, each unit having a top side, bottom side, right side, left side, forward face and rearward face, wherein said top side, bottom side, right side and left side may be shared with adjoining box units, said top side, bottom side, right side and left side each being defined by a pair of arms, the arms in each pair being joined to one another by a scissor connection intermediate their ends, said top side arms and said bottom side arms further including a telescoping member in at least one of said arms of an arm pair; and

connector block nodes located at each corner of said box units, each of said nodes including pivot means for securing said arms thereto and for allowing collapsing of said frame to a compact form; and



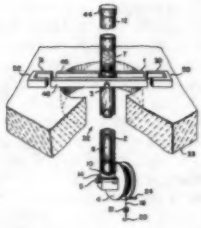
plural display supports extending along files of connector block nodes on the front face of said frame, each support extending between adjacent connector block nodes and including a pair of display-support runners, said runners being joined to one another at one, central end thereof by a central hinge, and joined to a connector block node at the other end thereof by an end hinge.

4,942,687

ICE FISHING MECHANISM

Joseph Post, 5 Rodgers Ave., Billerica, Mass. 01821

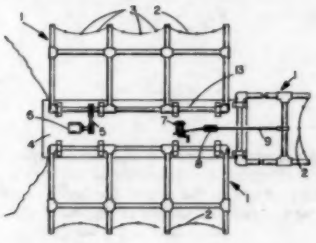
Continuation-in-part of Ser. No. 254,044, Oct. 6, 1988, abandoned. This application Aug. 31, 1989, Ser. No. 401,007
Int. Cl.[5] A01K *93/00*
U.S. Cl. 43—17 **12 Claims**



1. An ice fishing rig comprising a crossbar adapted to extend over a hole formed in ice on a body of water, a tubular pole, means supporting the pole on the crossbar with one end adapted to project into the water and the other above the ice, the tubular pole closed at its ends and containing fluid, with at least a portion of the other end of said pole transparent, said fluid within said tubular pole having a freezing point below zero degrees centigrade, a float positioned within said tubular pole and floating in said fluid which float, unless restrained, will rise to the top of said tubular pole and be visible through the transparent portion of the pole, a reel for holding a length of fishing line, means axially supporting said reel at the one end of the pole, magnetic means having a pair of mutually attracting components with one magnetic component positioned on said float and the other magnetic component positioned on said reel in positions such that alignment of the components will

restrain the float at the one end of the pole and when the components become non-aligned on rotation of the reel the float will rise in the tube.

4,942,688
APPARATUS FOR TROTLINE FISHING
Mit Thomas, 2960 Phyllis La., Dallas, Tex. 75234
Filed Feb. 15, 1989, Ser. No. 311,035
Int. Cl.[5] A01K *97/10*
U.S. Cl. 43—27.2 **2 Claims**

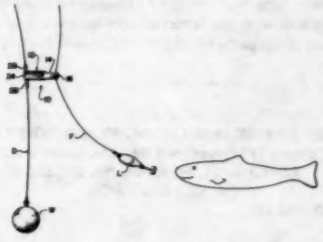


1. In an apparatus for trotline fishing from a support base adjacent a body of water, the combination comprising:
a. a framework supported from said base,
b. a means on said base for raising and lowering said framework relative to said body of water.
c. at least one trotline on said framework adapted to be lowered into said body of water for extended periods of time,
d. a plurality of fishing hooks spaced along said trotline and containing fish bait thereon,
e. and wherein said framework comprises multiple struts supported in said framework in a manner to rotate about a stationary axis of said framework.

4,942,689
FISHING WEIGHT
Donald J. Link, Shakopee, Minn., and Lonnie D. Stanley, Lufkin, Tex., assignors to Dylist, Inc., Shakopee, Minn.
Filed Jul. 5, 1988, Ser. No. 215,030
Int. Cl.[5] A01K *95/00*
U.S. Cl. 43—42.24 **12 Claims**

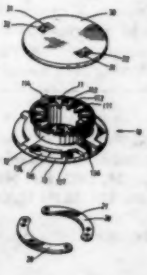
1. A fishing weight comprising a lead body portion having an axial bore therethrough, an enlarged recess formed in one end of said body portion, a flexible, rubbery material substantially filling said recess, a cavity formed in said rubbery material in said recess, said cavity opening into said axial bore and having another opening extending outwardly opposite said axial bore for receiving the eye of a fishhook, said other opening being of a smaller size than the eye of a fishhook and said cavity for releasably retaining the fishhook eye therein until a force is exerted upon said fishhook for withdrawing the fishhook therefrom.

4,942,690
DOWNRIGGER RELEASE
Theodore A. Lund, 4859 Lougheed Highway, Burnaby, British Columbia, Canada V5C 4A7
Filed Mar. 28, 1989, Ser. No. 329,590
Int. Cl.[5] A01K *91/06*
U.S. Cl. 43—42.12 **10 Claims**



1. A downrigger release, comprising:
(a) a first piece of flexible fastening material for releasable fastening to a downrigger line;
(b) a second piece of flexible fastening material for releasable fastening to said first piece of flexible fastening material; and,
(c) connector means for connecting said second piece of flexible fastening material to a fishing line:
wherein said first piece of flexible fastening material comprises an inner surface having a first portion comprising loop type fastening material and a second portion comprising hook type fastening material, said loop type fastening material being releasably fastenable to said hook type fastening material.

4,942,691
FISHLINE STORING BOX
Jin-Tsair Hwang, No. 5, 97 Lane, Ching- hou Street, Taipei, Taiwan
Filed Oct. 7, 1988, Ser. No. 254,580
Int. Cl.[5] A01K *97/06*
U.S. Cl. 43—54.1 **1 Claim**



1. A fishline storing box, comprising:

a cover having a plurality of engaging holes, each engaging hole being provided with a stop;

a main body including:

an upper ring-shaped plate having a plurality of ears extending inwardly, a plurality of lower surfaces each of which is aligned with a respective ear and a plurality of hooks upwardly extending, each of said lower surfaces having a V-shaped groove, each of said hooks being engageable with each of said engaging holes of said cover respectively;

a hollow cylinder coupled to said upper ring-shaped plate at an upper end thereof; and

a base plate connected to a lower end of said hollow cylinder to form a containing space, said base plate having a plurality of recesses formed within an outer rim of an upper surface thereof, a plurality of gaps defining an open communication between each recess and a groove formed in said base plate and a plurality of engaging holes which are engageable with the hooks of another main body; and

a plurality of magnets being received in said grooves respectively.

4,942,692

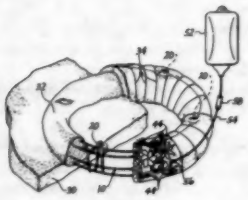
WIRE FRAME FOR LIVING PLANT WREATH

Mary T. Colbert, 187 Homewood Rd., Los Angeles, Calif. 90049

Filed Jan. 17, 1989, Ser. No. 297,252

Int. Cl.[5] A01G *5/00*

U.S. Cl. 47—41.12 **6 Claims**



1. An improved wire frame for supporting a festive wreath of living plant, comprising:

upper and lower pairs of generally concentric wire rings;

an intermediate pair of generally concentric wire rings;

a plurality of wire ribs circumferentially spaced apart along said rings and welded to both rings of said intermediate pair;

said ribs also being welded alternately to both rings of said upper pair or said lower pair, thereby to obtain a structurally rigid unitary toroidal wire frame; and

a plurality of candle holders spaced circumferentially on said frame, each said holder comprised of a single length of wire including a coiled wire segment for receiving and supporting the base of a candle and an extended wire segment welded to one ring in each of said upper and lower pairs for supporting said coiled segment and also structurally reinforcing the toroidal frame.

4,942,693

PLANT SUPPORTING UMBRELLA

Josie Sibold, 1109 E. Dallas Rd., Chattanooga, Tenn. 37405

Filed Mar. 24, 1989, Ser. No. 328,319

Int. Cl.[5] A01G *17/06*

U.S. Cl. 47—44 **10 Claims**

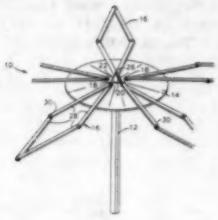
1. An umbrella-like arbor for supporting foliage thereon, comprising:

a center pole;

a central support hub atop the center pole; and

a plurality of lattice assemblies radiating from the support hub essentially in planes which intersect the axis of the center pole at the same large acute angle;

each of said lattice assemblies comprising an open framework of interconnected slats lying substantially in the planes of said lattice assemblies, respectively; and



means for rotatably supporting each of said lattice assemblies from said hub on axes generally parallel to the axis of the center pole so that the overall configuration of the arbor may be adapted to a variety of shapes.

4,942,694

FITTINGS FOR DOORS, WINDOWS OR THE LIKE

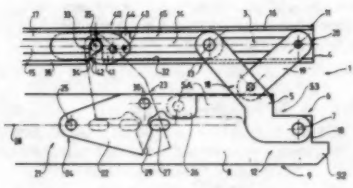
Philippe Simoncelli, Hoff, France, assignor to Ferco International Usine de Ferrures de Batiment, Sarrebourg, France

Filed Sep. 20, 1989, Ser. No. 409,757

Claims priority, application France, Sep. 26, 1988, 88 12721; Mar. 14, 1989, 89 03577

Int. Cl.[5] E05D *15/52*

U.S. Cl. 49—192 **19 Claims**



1. Fitting for doors, windows or the like, comprising a locking member or operating rod for locking the wing (9) against the fixed frame (11), and acting on hinged fittings consisting of a corner bearing and a casement stay disposed in rabbets, so that the said wing (9) can be opened at least inwardly and disposed in a ventilation position, this fitting comprising control means (21) for opening the wing (9), starting from the closed position, into the ventilation position, followed by inward opening of said wing, by acting successively on the locking member or operating rod (28, 28A).

4,942,695

METHOD FOR CYLINDRICAL SURFACE GRINDING OF WORKSPACES

Horst J. Wedeniwski, Remshalden-Grunbach, Fed. Rep. of Germany, assignor to Fortuna-Werke Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Oct. 17, 1988, Ser. No. 258,850

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1987, 3735343; Nov. 6, 1987, 3737641

Int. Cl.[5] B24B *5/04*

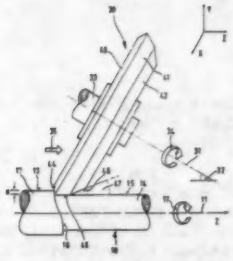
U.S. Cl. 51—165 R **4 Claims**

1. A method of grinding a cylindrical surface of a workpiece extending along a first axis, comprising of:

determining a diameter (d_w) of said cylindrical surface;

rotating said workpiece about said first axis at a predetermined first peripheral speed (V_w) in a first direction of rotation;

rotating a grinding wheel about a second axis, said second axis being inclined to said first axis, said grinding wheel being rotated at a second peripheral speed (V'_s) in a second direction opposite to said first direction, said grinding wheel having a first and a second conical peripheral surface section, said first surface section engaging an essentially radial helicoidal cutting surface and said second surface section engaging an essentially axial surface section of said cylindrical surface;



displacing said workpiece and said grinding wheel relative to each other at a predetermined feed speed (V_{fa}) in a direction parallel to said first axis;

selecting a desired roughness (R'_z) of said cylindrical surface after completion of grinding;

determining an overlap factor (U') of said grinding wheel from emperically generated curves of overlap factor (U) as a function of roughness (R_z) and second peripheral speed (V_s) using the selected roughness (R'_z) and second peripheral speed (V'_s);

setting an axial length (l_N) of said essentially axial surface section from the overlap factor (U') according to the formula:

$$l_N = U' \cdot q \cdot \frac{\pi \cdot d_w}{6 \cdot 10^4} \cdot \frac{v'_s}{v_s}$$

where (q) is the ratio (V'_s/V_w) of said second and said first peripheral speeds.

4,942,696

BLOCKING SHIM AND METHOD FOR PRESCRIPTION-LABORATORY PROCESSING OF ASPHERIC PROGRESSIVE-ADDITION LENSES

John T. Winthrop, Wellesley; Alexander F. Menyhart, Brimfield, and James Duszlak, Dudley, all of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Jun. 9, 1988, Ser. No. 204,567

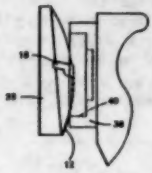
Int. Cl.[5] B24B *13/005*

U.S. Cl. 51—277 **12 Claims**

1. A shim for mounting aspherical opthalmic lens on a blocking for processing, the shim including:

a plastic element in the general shape of a "T" having a base member, whereby each of the members of the plastic element makes contact with the blocking ring to prevent rocking of said lens relative to said blocking ring and a pair of cross members; and

alignment indicia means at a point of intersection of said base and cross members, said alignment indicia means being



intended to be aligned with the distance fitting center of an aspherical opthalmic progressive lens to be processed.

4,942,697

RARE EARTH POLISHING COMPOSITIONS

Jean Khaladji, Paris, and Marcel Peltier, La Rochelle, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 707,139, Mar. 1, 1985, abandoned, which is a division of Ser. No. 218,792, Dec. 22, 1980, Pat. No. 4,529,410. This application Jun. 25, 1987, Ser. No. 65,633

Claims priority, application France, Dec. 27, 1979, 7931742

Int. Cl.[5] B24D *17/00*

U.S. Cl. 51—283 R **14 Claims**

1. A rare earth polishing composition of reproducible homogeneity produced by a process comprising: (a) simultaneously continuously admixing a cerium salt solution, a basic solution, and a solution of at least one acid and/or one salt, the anion or anions of which being adopted to form insoluble rare earth compounds, the number of equivalents of base being equal to or greater than the number of equivalents of cerium, and the pH of the reaction medium being greater than about 6; (b) filtering the precipitate which results from the reaction medium; (c) drying said recovered precipitate; and (d) calcining said dried precipitate, wherein said calcined precipitate comprises a sulphur content of less than 0.1% by weight.

4,942,698

OPENABLE ROOF AND STRUCTURE THEREWITH

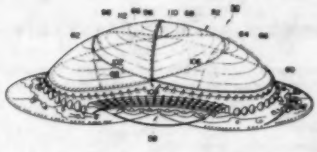
Takenori Kumagai, Tokyo, Japan, assignor to Shimizu Construction Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1989, Ser. No. 439,302

Claims priority, application Japan, Nov. 22, 1988, 63-295364; Dec. 19, 1988, 63-319743; Jan. 17, 1989, 1-8024

Int. Cl.[5] E04H *3/10*; **E04B** *346*

U.S. Cl. 52—6 **15 Claims**



1. An openable roof comprising:

a plurality of sets comprised of a fixed roof means and movable roof means;

said fixed roof means being fixedly constructed at prescribed locations, each of the fixed roof means having an opening substantially opening upwards, and a generally circular track around the opening; at least one part of each of the fixed roof means substantially intersecting a wall fo the other fixed roof means in such a manner that the openings partially coincide so as to form a complete opening;

said movable roof means being movably disposed on the fixed roof means, each of the movable roof means being

disposed radially inside the circular tracks formed on the corresponding fixed roof means, each of the movable roof means having a first arc-shaped edge disposed on the corresponding circular first track, the curvature of the first arc-shaped edge corresponding to the curvature of the circular first track of the fixed roof means so that each of the movable roof means is able to revolve around an axis of the first track of the corresponding fixed roof means so as to participate to open and close the complete opening.

4,942,699

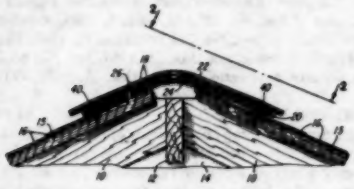
VENTING OF ROOFS

Larry J. Spinelli, Hamilton, Ohio, assignor to Benjamin Obdyke Incorporated, Warminster, Pa.

Continuation of Ser. No. 125,123, Nov. 25, 1987, abandoned. This application Oct. 13, 1989, Ser. No. 423,524

Int. Cl.[5] E04D *13/16*

U.S. Cl. 52—57 **16 Claims**



1. A vent installation on outer, relatively angled surfaces of a building, characterized in that the vent spaces a cap from said angled surfaces to provide a venting flow path for air to flow outwardly from the building through an elongated slot means formed at the juncture between the angled surfaces,

said vent comprising

an elongated openwork member providing multiple flow-paths for the venting flow of air from said elongated slot and beneath the cap, said openwork member comprising a resilient self-supporting matrix strip, and

a sheet material layer secured to and covering said openwork member and adapted to overly said elongated slot, said sheet material layer being an air-permeable filter material having a multiplicity of closely spaced openings for the free flow of venting air therethrough, said openings being relatively small to provide a barrier to the entry of insects into the interior of the building, through said elongated slot.

4,942,700

REVERSIBLY EXPANDABLE DOUBLY-CURVED TRUSS STRUCTURE

Charles Hoberman, 472 Greenwich St., New York, N.Y. 10013

Filed Oct. 27, 1988, Ser. No. 263,582

Int. Cl.[5] E04B *1/52*

U.S. Cl. 52—81 **12 Claims**

1. A loop-assembly comprising:

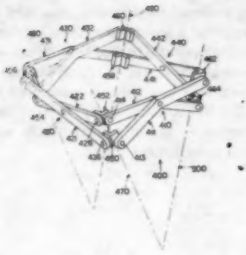
at least three scissors-pairs, at least two of the pairs comprising:

two essentially identical rigid angulated strut elements, each having a central and two terminal pivot points which do not lie on a straight line, each strut being pivotally joined to the other of its pair by their central pivot points,

each pair being pivotally joined by two terminal pivot points to two terminal pivot points of another pair such that both scissors pairs lie essentially in the same plane

whereby a closed loop-assembly is thus formed of scissors pairs, and this loop-assembly can freely fold and unfold without bending or distortion of any of its elements, and

a normal line that intersects and is perpendicular to the axes of any two terminal pivot points is non-parallel with at least two other similarly formed lines in the assembly,



the angles formed between said lines remaining constant as the loop assembly is folded and unfolded.

4,942,701

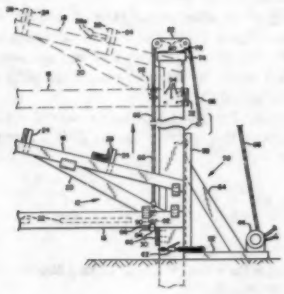
HYDRAULIC WINCH SYSTEM FOR USE IN ERECTING CLEAR-SPAN, POLE-TYPE BUILDINGS

Jimmie J. Jones, Portland, Oreg.; Sherman L. Watson, Vancouver, Wash., and Charles F. Pence, Portland, Oreg., assignors to Complete Hydraulic Building Systems, Inc., Portland, Oreg.

Filed Jul. 24, 1989, Ser. No. 383,709

Int. Cl.[5] E04G *21/14*

U.S. Cl. 52—126.1 **10 Claims**



1. For use in erecting erecting clear-span, pole-type, buildings including two rows of spaced apart, vertically placed, support poles disposed in opposite pairs and defining opposite sides to the building, and a plurality of roof-supporting truss assemblies arranged side-by-side and each assembly supported by cooperating pairs of opposed poles, each assembly including structural members forming guideways receiving cooperating poles in sliding engagement, each assembly being shiftable during erection of the building between a low level, building-assembly position wherein it is freely slidable on said cooperating poles and an elevated, building-erected position wherein it is attached to the upper portions of the poles preparatory to mounting a roof thereon, an hydraulic winch system for raising the truss assembly from its building assembly position to its building erected position, the hydraulic winch system comprising:

(a) an hydraulic circuit,

(b) in the hydraulic circuit a plurality of hydraulic winches, one for each associated pole,

(c) in the hydraulic circuit valve means for controlling the speed and direction of rotation of each winch,

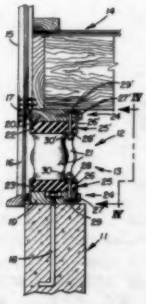
(d) winch mounting means adjacent each associated pole,

(e) pulley means mounted at the top of each associated pole,
(f) cable means mounted on each winch, reeved about the associated pulley means, and extending downwardly with its end adjacent the truss assembly in its low level. building-assembly position, and
(g) connecting means on the said end of the cable means for connection to the truss assembly.

4,942,702
PRE-FABRICATED PANEL FOR BUILDING, PARTICULARLY FOR BURIAL VAULTS
Paul Lemasson, La Cappe, Cedex 2121, Genilac F-42800, France
PCT No. PCT/FR88/00236, § 371 Date Jan. 11, 1989, § 102(e) Date Jan. 11, 1989, PCT Pub. No. WO88/08912, PCT Pub. Date Nov. 17, 1988
PCT Filed May 11, 1988, Ser. No. 309,794
Claims priority, application France, May 12, 1987, 88 07003
Int. Cl.[5] E04H *13/00*; E04C *2/26*
U.S. Cl. 52—127.7 **8 Claims**

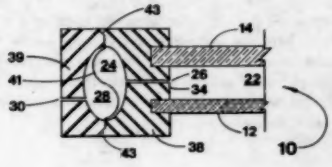
1. Pre-fabricated panel for the construction of burial vaults in particular, wherein each panel is made up of a plate (1) of insulating material inserted during moulding, between two layers of cement (2) and (3) of different density and thickness, the external layer (3) being very slightly crowned, the transversal faces of the end of each panel being fitted in combination in order to enable their axial alignment positioning or angular positioning at 90° whilst being fitted with means apt in order to provide their assembly into position, the said panel being also designed in order to cooperate and be centered with a bottom plate (5) and/or a plate acting as a cover (6).

4,942,703
EARTHQUAKE-PROOF ABSORPTION SYSTEM FOR BUILDINGS OR THE LIKE
Charles M. Nicolai, P.O. Box 2517, Sausalito, Calif. 94965
Filed Jun. 19, 1989, Ser. No. 368,269
Int. Cl.[5] E04B *1/98*; E02D *31/08*
U.S. Cl. 52—167 R **19 Claims**



1. An earthquake-proof structure supported on a foundation by seismic shock absorption means for isolating said structure from movements of said foundation, said seismic shock absorption means comprising
a plurality of elastomeric pad means supporting said structure on said foundation for isolating said structure from horizontal and vertical movements imparted to said foundation when ground surrounding said foundation is subjected to seismic activity, said elastomeric pad means comprising a plurality of upstanding and at least generally aligned elastomeric columns secured between elastomeric upper and lower anchor pads, and
anchoring means for securing said elastomeric pad means between said structure and said foundation, said anchoring means securing said upper and lower elastomeric anchor pads to said structure and to said foundation, respectively, and comprising a pair of brackets each having a first flange disposed on an underside of said elastomeric upper anchor pad and on an upper side of said elastomeric lower anchor pad, respectively, and
fastening means extending through each said first flange and a respective one of said elastomeric upper and lower anchor pads and secured to a respective one of said structure and said foundation.

4,942,704
SPACER ELEMENT FOR MULTIGLAZED WINDOWS AND WINDOWS USING THE ELEMENT
Richard T. King, 101 NE. 62nd, Seattle, Wash. 98115
Continuation-in-part of Ser. No. 233,535, Aug. 18, 1988. This application Jun. 1, 1989, Ser. No. 359,507
The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.
Int. Cl.[5] E06B *7/12*
U.S. Cl. 52—171 **33 Claims**



1. A spacer element for glass sheets in a multiglazed window which comprises:
an elongated body member of generally rectangular cross section, said body member having first and second face portions and parallel spaced-apart sidewall portions,
the body member having an elongated interior chamber generally located along its longitudinal axis,
said interior chamber being partitioned by a flexible diaphragm means into two separate chambers not in fluid communication with each other, said diaphragm being of generally sinuous configuration, the ends of the diaphragm being anchored across a diameter of the interior chamber so as to divide the interior chamber into two portions of essentially equal cross sectional area;
a multiplicity of longitudinally spaced-apart first apertures which pass between one of the separate chambers and the first face portion; and
a multiplicity of longitudinally spaced-apart second apertures which pass between the other separate chamber and the second face portion,
so that when the spacer element is in place to separate the glass sheets of a multiglazed window, one of the chamber is in fluid communication with the interior volume between the glass sheets and the other chamber is in fluid communication with the external environment, the diaphragm means being moveable to equalize pressure differ-

ences between the interior volume of the window and the external environment.

4,942,705

WINDOW GRATING ARRANGEMENT

Takashi Nakamura, Amagasaki, Japan, assignor to Nakamura Co., Ltd., Hyogo, Japan

Filed Jul. 24, 1989, Ser. No. 384,738
Claims priority, application Japan, Oct. 3, 1988, 63-129737[U]; Jan. 27, 1989, 1-9035[U]
Int. Cl.[5] E06B 3/26
U.S. Cl. 52—202 6 Claims

1. A window grating arrangement comprising at least two enlogated, horizontal stationary supports disposed parallel relative to one another and being attached to upper and lower edges of a window opening in the wall of a buiding, an elongated groove formed in each of said supports substantially along the length thereof, a mobile assembly comprised of a protective grating having protective bars, and of at least two cross ties disposed parallel relative to one another and uniting the protective bars into said protective grating, a cross tie each being slidably disposed within an elongated groove, whereby the protective grating selectively covers the window opening and is slidable away from such covering to enable egress through said opening.

4,942,706

HOUSING STRUCTURE

Wayne A. Todd, 2213 Kirby Rd., Memphis, Tenn. 38119, and Hunter D. Ryan, Jr., 283 Richards Way, Cordova, Tenn. 38018

Filed Nov. 13, 1989, Ser. No. 435,545
Int. Cl.[5] E04H 1/02
U.S. Cl. 52—234 12 Claims

1. A double unit building structure comprising:
a first unit having a front elevation, a rear elevation, a first side wall, and a second side wall; and
a second unit having a front elevation, a rear elevation, a first side wall, and a second side wall;
said first and second units being joined together to form said double unit building structure with first side walls of said first and second units sharing a common border and with said front elevations of said first and second units facing opposite directions.

4,942,707

LOAD-BEARING ROOF OR CEILING ASSEMBLY MADE UP OF INSULATED CONCRETE PANELS

Erik W. Huettemann, 285 Mill Rd., Madison, Ala. 35758

Continuation-in-part of Ser. No. 158,476, Feb. 22, 1988, Pat. No. 4,841,702. This application Jun. 27, 1989, Ser. No. 371,915
The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.
Int. Cl.[5] E04B 1/60
U.S. Cl. 52—259 12 Claims

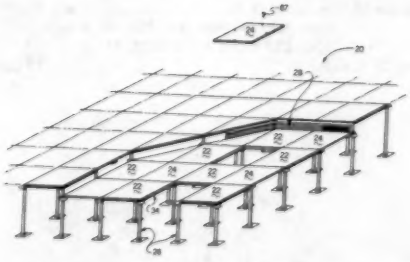
1. A load-bearing roof or ceiling assembly comprising:
a plurality of elongated, rectangular panels disposed side by side, forming an array having interior junctures between adjacent panels and external panel edges at edges of the array;
said panels comprising at least one rigid rectangular slab of insulating material having an upper face and a lower face, said upper face having a plurality of longitudinally extending grooves therein, forming channels for containing supporting ribs, concrete cast into said grooves and over said upper face providing concrete ribs and a concrete layer over said face;
said panels at external edges of the array including cast concrete edge frames integral with said ribs and concrete layer; and
said panels at their interior junctures with one another having exposed panel edges without edge frames, said panel edges at interior junctures being sealably joined to one another after placement of panels in operative position in the array.

4,942,708

PANEL ASSEMBLY AND SUPPORT STRUCTURE FOR ELEVATED FLOORS

Frank C. Krumholz, and Michael D. Jines, both of Owatonna, Minn., assignors to Wenger Corporation, Owatonna, Minn.

Continuation of Ser. No. 426,086, Nov. 23, 1988, abandoned. This application Aug. 15, 1989, Ser. No. 394,283
Int. Cl.[5] E04D 15/00
U.S. Cl. 52—263 11 Claims



1. An elevated floor assembly comprising:
a plurality of base panels each having an upper surface, a lower surface and a peripheral edge each of said base panels including a base panel cladding strip received along said base panel edges, said base panel cladding strips each having a generally upright web extending approximately the thickness of said base panel edge, and a generally horizontal access panel engaging flange extending laterally and outwardly from said web;

a plurality of access panels each having an upper surface, a lower surface and a peripheral edge; and

a plurality of support legs detachably coupled to said base panels, said base panels and said access panels being positioned in alternating juxtaposition whereby said base panels are supported by said support legs and said access panels are supported by said base panel cladding strip flanges.

4,942,709

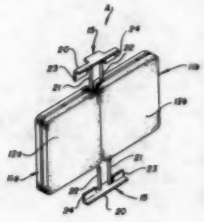
DISPLAY PANELS AND CONNECTOR SYSTEM THEREFOR

Michael P. Waldron, 2041 Tustin Ave. #A, Costa Mesa, Calif. 92627

Continuation of Ser. No. 129,780, Dec. 7, 1987, abandoned. This application Mar. 22, 1989, Ser. No. 327,386

Int. Cl.[5] E04B 1/40

U.S. Cl. 52—285 **29 Claims**



1. A display component for an exhibit or the like, which component comprises:

a pair of panels having outwardly facing surfaces bounded by edges, the panels being relatively thin compared with the area of their outwardly facing surfaces, a first edge of one panel meting a first edge of the other panel, such that their outwardly facing surfaces together form an essentially coextensive portion of the exhibit, said first meeting edges terminating at least one corner of each panel where each edge turns at substantially ninety degrees onto a second, adjacent edge of the panel,

each panel having an at least partially circular channel extending substantially parallel to both of said first and second edges, extending near but spaced inwardly by the same distance as each other from its respective edge, ending at entry openings near the said corner, on the other of said first or second edges, and each channel extending from its entry opening at said other edge, at least partially along its respective edge, such that the two channels intersect each other near the corner where the first and second edges meet,

each of said edges which has an entry opening also including a tin central slot extending along the centerline of its outer periphery adjacent each of said entry openings, its depth into its edge being substantially greater than its width across its edge,

and a connector member for connecting said pair of panels together, said connecting member comprising a pair of substantially parallel pins, said pins engaging into substantially parallel entry openings, one on each of the two panels of the pair, and hence extending partially into the channel which is an extension of said entry opening and which extends parallel to an edge of the panel which is adjacent to the edge with that entry opening, and

said connecting member further including generally flat thin flags which extend generally parallel to each of the pins edgewise into the said thin central slot of the panel adjacent the entry opening of its respective pin such that the plane which includes the flat thin flag is parallel to the outwardly facing surfaces of its panel.

4,942,710

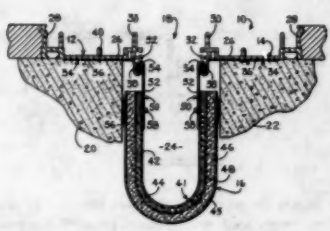
FIRE-RATED EXPANSION JOINT HAVING THREE DEGREES OF FREEDOM

Roger L. Rumsey, Wichita, Kans., assignor to Balco International, Inc., Wichita, Kans.

Continuation of Ser. No. 190,289, May 6, 1988, abandoned. This application Dec. 13, 1989, Ser. No. 453,095

Int. Cl.[5] E04B 1/56

U.S. Cl. 52—396 **8 Claims**



1. An expansion joint for use between a pair of elongated, adjacent, relatively shiftable structural sections presenting therebetween an expansion void having a nominal width, said joint exhibiting three degrees of freedom for accommodating virtually all relative movement of said structural members, said joint comprising:

a pair of elongated supports configured for fixed attachment to a respective structural section adjacent the expansion void;

an elongated, flexible, bridging member composed of a fire-rated material having a width greater than the nominal width of the void and presenting a pair of respective, longitudinal edges; and

means coupling said bridging member with said supports in a void-spanning relationship therewith and in a manner allowing lateral shifting of said member in the event of relative lateral movement of said supports, and allowing vertical movement of at least a portion of said member in the event of relative vertical movement of said supports,

said coupling means including a pair of shiftably interfitted, elongated, U-shaped elements respectively coupling at least one of said edges of the flexible member and the adjacent support, one of said elements being secured to said support, the other of the elements being secured to said member edge, each of said U-shaped elements presenting a pair of side walls with one side wall from each element lapping a side wall of the other element in a longitudinally slidable relationship in order to prevent longitudinal stress on said bridging member in the event of relative longitudinal movement of said support, said coupling means further supporting said bridging member in a depending relationship for disposition thereof downwardly from said structural sections so that said bridging member hangs between said supports.

4,942,711

OUTER WALLS OR ROOFS

Dan Bergquist, Nässjö , Sweden, assignor to Swedal-Systems HB, Nässjö , Sweden

Filed Jan. 18, 1989, Ser. No. 298,486

Claims priority, application Sweden, Jan. 19, 1988, 8800155

Int. Cl.[5] E04B 1/62

U.S. Cl. 52—397 **5 Claims**

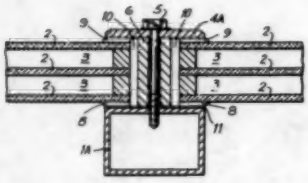
1. An outer wall or roof construction system comprising:

a plurality of wall panels;

first and second internal frame members disposed inwardly of said wall panels for supporting said wall panels, each of said frame members having a surface facing said wall panels and that defines a plane, and said first and second

frame members being disposed in abutting relation to each other so that said planes of the frame members define a common plane and said abutting frame members form a crevice therebetween;

an external cover member disposed outwardly of said wall panels and in spaced apart relation to said frame members so that said wall panels are disposed between the cover member and said frame members;



fastener means for securing the cover member to said frame members with said wall panels secured intermediately therebetween; and

a sheet-like sealing member comprising a layer of a ductile sealing foil disposed substantially parallel to said common plane of said frame members and covering said crevice formed between said abutting frame members so as to form a weather-tight seal at said internal frame members.

4,942,712

ROOF COVERING

Peter B. Thompson, Nordrach, Blagdon, Bristol BS18 6XW, United Kingdom

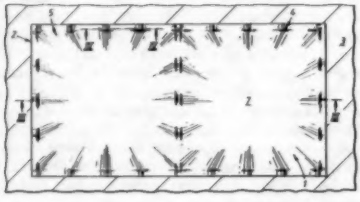
PCT No. PCT/GB87/00838, § 371 Date Jul. 19, 1988, § 102(e) Date Jul. 19, 1988, PCT Pub. No. WO88/03981, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 24, 1987, Ser. No. 223,072

Claims priority, application United Kingdom, Nov. 24, 1986, 8628021

Int. Cl.[5] E04D *3/32, 3/30*; E04C *2/32*

U.S. Cl. 52—506 **20 Claims**



1. A roof covering suitable for use on flat or shallow angle roofs, the covering being in the form of a sheet having means for accommodating substantial expansion and contraction of the sheet along its plane dimensions, said means comprising at least one preformed raised deformable intermediate region of the sheet having a predetermined subtended volume and merging curvedly downwardly over upwardly convex surface portions of the sheet directly into pluralities of preformed smooth deformable undulations surrounding the raised region, with each undulation being of subtended volume small compared with said predetermined volume of the raised region, and with the lower points of at least some of the undulations being arranged to rest upon and to be secured to a substantially planar roof substrate.

4,942,713

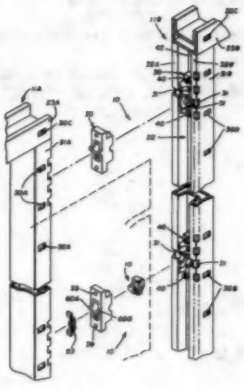
INTERCONNECTING STRUCTURE FOR RELEASABLY SECURING SUCCESSIVE PANELS IN A RELOCATABLE WALL

Francis G. Jackson, Hudsonville, Mich., assignor to Harter Corporation, Sturgis, Mich.

Filed Jun. 9, 1989, Ser. No. 364,027

Int. Cl.[5] E04C *1/10*

U.S. Cl. 52—584 **23 Claims**



1. An interconnecting structure for joining wall panel assemblies in a relocatable wall, said interconnecting structure comprising:

cam key block means;

cam surfaces formed on said cam key block means;

cam key means having a disk portion;

at least two locking bolt means extending transversely outwardly from said disk portion, said locking bolt means being disposed in diametric opposition;

said locking bolt means being complementary to said cam surfaces on said cam key block means;

said cam key means being rotatable with respect to said cam key block means selectively to position said locking bolt means in engagement with the cam surfaces on said cam key block means.

4,942,714

REBAR AND BEAM BOLSTER, SLAB AND BEAM BOLSTER UPPER

Marshall E. Langley, Jr.; Robert C. Sims; Richard M. Sims, and James N. Turek, all of Lexington, Ky., assignors to Turek Marketing International, Lexington, Ky.

Continuation-in-part of Ser. No. 152,701, Feb. 5, 1988, abandoned. This application Feb. 6, 1989, Ser. No. 308,953

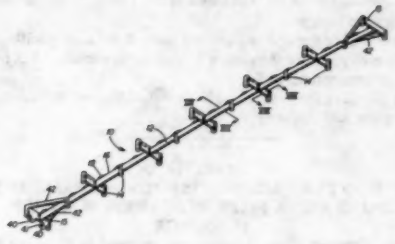
Int. Cl.[5] E04C *5/20*

U.S. Cl. 52—687 **17 Claims**

1. A bolster for supporting reinforcing steel such as beams and rebar in concrete during pouring and setting of said concrete, comprising:

an elongated support member having a surface for supporting said reinforcing steel and leg means for holding said support member in an upright position; said support member and leg means being constructed from a non-biodegradable material; said bolster further including first and second cross members at opposite ends of said bolster as well as means for positively connecting bolsters together in series, said connecting means including a resilient con-

necting clip mounted to said first cross member at one end of said bolster, said clip being sufficiently resilient to snap



over and engage a second cross member of an adjacent bolster.

4,942,715

APPARATUS FOR THE STABILIZATION AND DRYING OF CUBOID PACKS

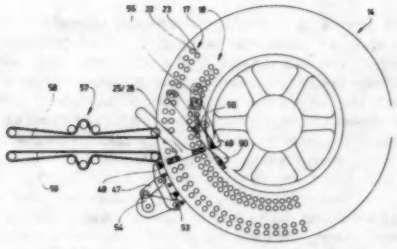
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Oct. 27, 1988, Ser. No. 263,574

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1987, 3736403

Int. Cl.[5] B65B *51/10*

U.S. Cl. 53—202 **15 Claims**



1. Apparatus for the dimensional stabilization and drying of hinge-lid cuboid packs having folding tabs glued to one another, said apparatus including a drying turret which has a plurality of pockets forming a pocket ring arranged along a concentric circular path, each pocket being adapted to receive a pack, said apparatus being characterized in that:

the drying turret (14) has at least two concentric pocket rings (17, 18) of pockets (15, 16);

the pockets (15, 16) of the pocket rings (17, 18) are aligned with one another in pairs in common radial planes;

in the outer pocket ring (17), a radially outer pocket wall (28) and, in the inner pocket ring (18), a radially inner pocket wall (29) is mounted resiliently and is movable outwards and inwards respectively;

in a pushing-out station (24) and in a pushing-in station (35) of the drying turret (14), the resilient pocket walls (28, 29) are equipped with actuating means, in the form of outwardly directed tension pins (33), and are moved to enlarge the pocket by stationary actuating members during operation of the apparatus;

there is provided means for pushing the packs (10, 11) out of the pockets (15, 16) of the drying turret (14) in an axial direction in the pushing-out station (24) and transferring them to a horizontal discharge conveyor (57) and individually conveying them away thereby in an upright position with narrow side walls (12, 13) of the packs directed downwards and upwards;

there is provided an intermediate conveyor (60) for feeding the packs (10, 11) pushed out of the pockets (15, 16) of the drying turret (14) to the discharge conveyor (57); and

the intermediate conveyor (60) is a continuously rotating conveyor wheel (61) with projecting take-up arms (62), and packs (10, 11) are grasped in succession by the take-up arms (62) and fed to the discharge conveyor (57) along a path in the form of an arc of a circle.

4,942,716

ASEPTIC FILLING MACHINE

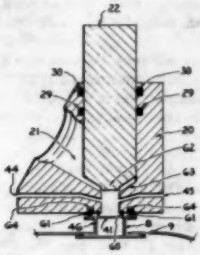
Ian M. Anderson, Sandringham, Australia, assignor to Courtaulds Packaging Australia Limited, Australia

Filed Nov. 20, 1987, Ser. No. 123,096

Claims priority, application Australia, Nov. 21, 1986, PH09089

Int. Cl.[5] B65B *55/08, 55/10, 43/26, 7/02*

U.S. Cl. 53—426 **7 Claims**



1. A system for aseptically filling and storing degradable liquid contents which comprises:

(a) a flexible container having a sealed inlet, said inlet being capable of being opened and resealed;

(b) a fluid dispenser which incorporates a sterilizable product conduit comprising

(i) two openings for allowing ingress and egress of degradable liquid contents

(ii) one of said openings being adapted to abut a container inlet

(iii) a valve member adapted for reciprocal movement within said conduit for closing the other of said openings

(iv) at least one sterilizing fluid inlet and at least one sterilizing fluid outlet opening onto said conduit adjacent the opening which abuts the container inlet,

(c) container support means for bringing said container inlet into engagement with said filling head such that said recess is closed by the container inlet;

(d) means for injecting said sterilizing fluid into said recess;

(e) means located about the periphery of said one opening to open said container inlet;

(f) means to actuate said valve to allow liquid to pass through said recess, and fill said container; and

(g) means located external to said fixed filling head to reseal said inlet.

4,942,717

PROCESS FOR THE PREPARATION OF STERILIZED PLANT MATTER

George Komub, P.O. Box 280, Smoky Lake, Alberta, Canada

Filed Jul. 26, 1988, Ser. No. 224,580

Int. Cl.[5] B65B *1/24, 31/06, 55/14*

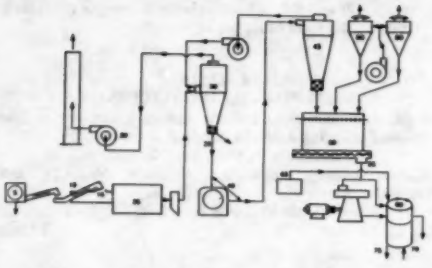
U.S. Cl. 53—428 **16 Claims**

1. A process for the preparation of sterilized plant matter comprising the steps of:

a. treating coarse chopped plant matter with heat to achieve dehydration;

b. compression filling airtight fiber reinforced plastic bags with the still heated dehydrated plant matter;

c. injecting high pressure steam into the heated dehydrated plant matter while in the bag, the size of the bag being such that the high pressure steam can completely and



sufficiently penetrate through the heated dehydrated plant matter to attain temperatures sufficient to achieve sterilization; and

d. sealing the bag whereby the temperatures in the bag are maintained for sufficient time duration to achieve sterilization, and condensing steam is absorbed by the dehydrated plant matter to create vacuum conditions in the bag.

4,942,718

PROCESS FOR THE PACKAGING OF LIDS

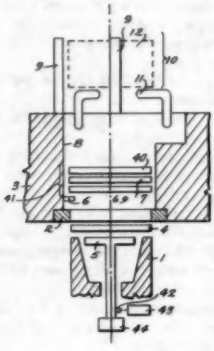
Michel Courtois, Saint Gratien, and Jacques Filion, Chelles, both of France, assignors to Cebal, Clichy, France

Filed May 27, 1988, Ser. No. 199,787

Claims priority, application France, Jun. 17, 1987, 87 08894

Int. Cl.[5] B65B *3/12, 5/06, 7/28, 39/06*

U.S. Cl. 53—435 **5 Claims**



1. A process for the packaging of lids, comprising the steps of:

(a) cutting out from blank material lids in a press equipped with a fixed delivery magazine defined at the sides thereof by guide rods;

(b) conveying by a pushing motion the lids beyond the cutting tool and into the delivery magazine such that the lids form a stack which is supported at its base by movable supports;

(c) covering both the guide rods of the delivery magazine and the stacked lids in the magazine with a substantially cylindrical casing, portions of which surround the guide rods such as to immobilize the stacked lids within an transversely of the casing with a slight clearance;

(d) positioning the casing on the movable supports;

(e) retaining the stacked lids in position upon internal extensions formed on said casing adjacent the base thereof;

(f) extracting the stacked lids and the casing from the delivery magazine;

(g) covering the top and bottom ends of the casing with caps thereby sealing the casing to protect the stacked lids from contamination; and

(h) handling the casing and lids stacked therein for transportation and delivery.

4,942,719

METHOD FOR PACKING FIBROUS MATERIAL INTO BALES AND A FIBER BALE PRESS SUITABLE THEREFOR

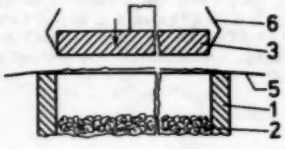
Gerold Fleissner, Chur, Switzerland, assignor to Fleissner Maschinenfabrik AG, Rebstein/Schweis, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,010

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1987, 3732376

Int. Cl.[5] B65B *1/24, 13/20, 5/00*

U.S. Cl. 53—436 **6 Claims**



5. A process for the packaging of fibrous material into a bale in an upright vertical fiber baling press, which comprises inserting a press box consisting of a press box casing with a detachable bottom plate and containing filled-in fibrous material into the baling press; placing a sheet-like piece of packaging material for the top side of the bale to be formed on the topside of the press box casing over the filled-in fibrous material; introducing a ram plate of the press ram downwardly into the press box casing to compress the fibrous material into a bale, said ram plate having lateral surfaces provided with means for urging the packaging material away from said surfaces; detaching the press box casing from the bottom plate; pulling the press box casing upwardly off of the bale of compressed fibrous material with marginal edge sections of the packaging material protruding with respect to a compression surface of the ram plate of the press ram; urging the marginal edge sections of the packaging material, after upwardly removal of the press box casing, away from the ram plate of the press ram with said means; and moving the press box casing overlying a top edge of the bale of fibrous material whereby all marginal edge sections of the piece of packaging material are folded over inwardly toward the sides of the bale.

4,942,720

BOTTOM CASE LOADER AND METHOD

Joseph C. Berney, 8755 Caminito Abrazo, La Jolla, Calif. 92037

Filed Jul. 29, 1988, Ser. No. 225,862

Int. Cl.[5] B65B *5/10, 35/30, 35/40, 35/50*

U.S. Cl. 53—447 **9 Claims**

1. A method of loading product into a case from a bottom comprising:

receiving product;

moving received product through an open side wall of a product arrangement area, having three walled sides, on an elevator platen; and arranging the moved product as a first layer of product;

walling the open side wall to the arrangement area such that a removable fourth side wall is formed;

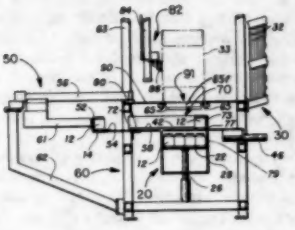
lowering the elevator platen and the first layer of product

thereon to a lower position such that the first layer can receive an additional layer of product that is to be slipped off a slip sheet;

removing the fourth side wall of the arrangement area;

moving a slip sheet to an inserted position where it serves as the floor of the arrangement area;

moving received product through the open side wall of the product arrangement area onto the slip sheet and arranging the moved product as a second layer of product;



walling the open side wall of the arrangement area;

moving the slip sheet to a retracted position outside of the arrangement area such that the layer of product thereupon drops onto the layer of product on the elevator;

positioning an open case above the arrangement area such that the case opening is downward oriented; and

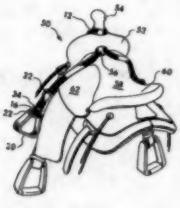
raising the elevator platen such that the stacked layers of product thereon are inserted into the opened case.

4,942,721

YOUTH STIRRUP ATTACHMENT

Pershing R. Van Scoyk, 7193 W. 32nd Ave., Wheat Ridge, Colo. 80033

Filed Mar. 3, 1989, Ser. No. 318,651
Int. Cl.[5] B68C *1/16*
U.S. Cl. 54—46 **6 Claims**



3. A combination full-sized adult saddle having a saddle horn and a hole formed in the pommel of said saddle and a youth stirrup attachment for a person having a small build to ride horseback using said saddle, said attachment comprising:

an elongated strap;

a first stirrup mounted on one end of said strap;

a second stirrup mounted on the other end of said strap; said strap retaining

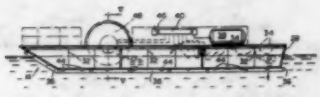
said attachment on said saddle solely by frictional engagement of said strap with the rear of said saddle horn, whereby said strap is inserted through said hole and looped over said saddle horn so said strap frictionally engages said rear of said saddle horn as weight is applied to both of said stirrups.

4,942,722

PLANT HARVESTER

J. Armand Desrosiers, 212 Scenic Glen Pl. N.W., Calgary, Alberta, Canada

Division of Ser. No. 938,189, Dec. 5, 1986, Pat. No. 4,815,260.
This application Nov. 28, 1988, Ser. No. 276,873
Int. Cl.[5] A01D *34/03, 34/43, 34/64*
U.S. Cl. 56—8 **1 Claim**



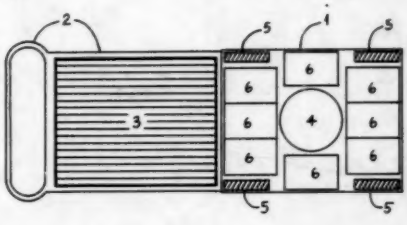
1. A floating harvester comprising a buoyant hull, said hull including a plurality of independent compartments for entrapping air independently therein, said compartments containing openings therein for allowing ingress and egress of water for entrapping air in said compartments and floating said hull upon a body of water, harvester means carried by said hull for harvesting plant growth in said body or water, and means carried on said hull for varying the amount of water and air entrapped in said compartments for adjusting the freeboard of said hull, said means for varying the amount of water and air comprising a source of pressurized air, means for connecting said source of pressurized air to said independent compartments for introducing pressurized air into said compartments for increasing the freeboard of said hull and simultaneously changing the operating depth of said harvester means, each of said compartments including upright partition means therein for damping transverse movement of water contained within said compartments, a top portion of each of said compartments being closed for preventing escape of air therefrom, and said upright partition means being spaced below said top portion for distributing said pressurized air in each of said compartments while damping transverse movement of water within each compartment.

4,942,723

SOLAR POWERED LAWNMOWER

Stephen R. Wassell, 8542 Mt. Vernon Hwy., Alexandria, Va. 22309

Filed Sep. 21, 1989, Ser. No. 410,549
Int. Cl.[5] A01D *34/00, 69/00*
U.S. Cl. 56—10.6 **2 Claims**



1. A lawnmower comprising, in combination, an electric motor, a rechargeable battery park, and a panel of photovoltaic cells, with said motor, said battery pack, and said photovoltaic cells electrically connected, which has said photovoltaic cells positioned in the region of the lawnmower defined by the perimeter of the handle of the lawnmower so that said photovoltaic cells are tilted at the same angle as the handle, with the angle arranged to be approximately perpendicularr to the rays of the sun during periods of solar exposure to said photovoltaic cells, which has said battery pack recharged with the electricity generated by said photovoltaic cells when the lawnmower

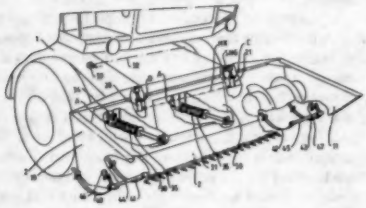
is placed in the sunlight, so that said battery pack then possesses the means to power said electric motor.

4,942,724

APPARATUS AND METHOD FOR CHANGING THE POSITION OF A MOWING MECHANISM

Norbert Diekhans, Gütersloh; Werner Fitzner, Sassenberg, and Heinrich Ostrup, Harsewinkel, all of Fed. Rep. of Germany, assignors to CLASS OHG, Harsewinkel, Fed. Rep. of Germany

Filed Mar. 9, 1989, Ser. No. 321,595
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1988, 3807610
Int. Cl.[5] A01D *35/00*
U.S. Cl. 56—10.4 28 Claims



1. A regulating apparatus on a self-propelled harvester (1) having a mowing bar (2), which is swivelable under hydraulic control in a vertically adjustable manner and transversely to the travel direction, and which has ground scanners (40–47) on the side, ground clearance signals (SR, SL) which are supplied to a control unit (ST) for regulating a swiveling transversely to the travel direction,

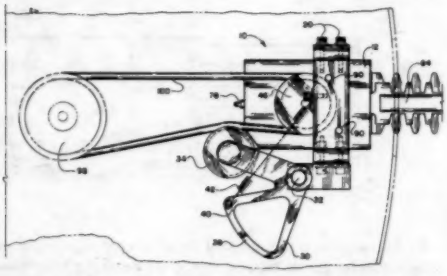
characterized in that the difference between the ground clearance signals (SR,SL) is used for regulating the swiveling, and the ground clearance signals mean value (SR, SL) serves as am actual-value component for a regulation of a cutting height of the mowing bar (2).

4,942,725

HORIZONTAL CUTTING MACHINE

Fred A. Ruder, Sr., 39975 Jones Rd., Wellington, Ohio 44090

Filed Jul. 3, 1989, Ser. No. 374,997
Int. Cl.[5] A01D *34/06, 34/33, 34/34*
U.S. Cl. 56—16.9 3 Claims



1. A mowing machine and power driving source comprising:

a mowing deck including an underside deck surface,

a transfer block including a base support, having a plurality of sides,

a first connecting member affixed to one of said sides of said base support,

a second connecting member affixed to another of said base support sides,

a third connecting member connected to said first and said second connecting members such that a generally rectangular configuration is described by said base support member and said first, second and third connecting members, said third connecting member being attached to the underside deck of said mowing machine, said base support member being further supplied with an opening having a longitudinal axis generally parallel to a plane described by said first, second and third connecting members,

a bearing member including a bearing surface and a keyway slot at one end of said bearing surface, said bearing being slidingly inserted into said opening located on said base support, said bearing member further including on one terminating end thereof, a boss disposed on said end of said bearing member and positioned a certain distance away from the longitudinal axis of said bearing member,

a pulley member mounted on said bearing member, and including keyway means for fastening said pulley to said bearing member,

an idler arm adjustably mounted on one of said connecting members, said idler arm further including an idler pulley,

a torque converter extending from said power driving source and being connected to said pulley member via an endless belt, and

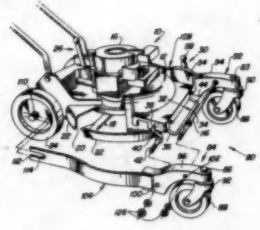
a bar cutter, having an elongated slot, mounted onto said base support member such that said boss sits within said slot such that when rotational motion is applied to said pulley member said boss member imparts reciprocating movement to said bar cutter containing said slot.

4,942,726

MECHANISM AND METHOD FOR CONVERTING A FIXED WHEEL WALK-BEHIND MOWER TO A CASTER WHEEL WALK-BEHIND MOWER AND VICE VERSA

Hoel L. Bowditch, Foxboro, Mass., assignor to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 90,648, Aug. 28, 1987, abandoned. This application Nov. 7, 1988, Ser. No. 270,480
Int. Cl.[5] A01D *34/74*
U.S. Cl. 56—17.2 31 Claims



1. A caster wheel conversion mechanism for a walk behind mower having a housing with front and rear axles carrying fixed direction wheels, said mechanism adapted to convert two fixed wheels to castering wheels and comprising:

at least two caster wheel assemblies each having axle receiving means formed therein; and

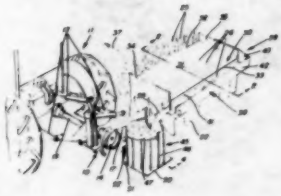
at least two interconnection means, each operatively connectable to a respective one of said caster wheel assemblies and said housing, for operatively interconnecting each of said caster wheel assemblies with said housing such that whenever the cutting height of said mower is set and both the front and rear wheels are adjusted to the approximate same height, said caster wheels remain approximately perpendicular to the surface upon which they are supported.

4,942,727

SEED COLLECTOR DEVICE FOR A MOWER

William D. Gian, 15188 Princeton Rd., Cerulean, Ky. 42215

Filed Oct. 23, 1989, Ser. No. 425,118
Int. Cl.[5] A01D *45/30*
U.S. Cl. 56—126 11 Claims



1. A seed collector device for a mower apparatus adapted to move in a longitudinal direction, having a blade device extending transversely of the longitudinal direction and adapted to cut the stalks of vegetation having heads of seed above the blade device, comprising:

(a) a seed collection tray having a longitudinal dimension and a transverse dimension, a top surface, a front transverse edge, a rear transverse edge portion, and opposite ends;

(b) support means mounting said tray above said blade device, said front transverse edge being at an elevation below the seed heads of the vegetation to be cut by said blade device, to engage said stalk as said tray moves forward to cause the seed from the seed heads to fall upon said top surface,

(c) said top surface declining from said front transverse edge toward said rear edge portion, and

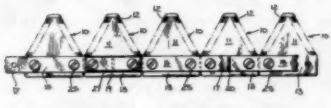
(d) collector means for receiving seed moving downward and rearward over said top surface.

4,942,728

STICKLE BAR JOINT CONSTRUCTION

Maurice Loring, Rushville, Ill., assignor to Kondex Corporation, Lomira, Wis.

Filed May 23, 1988, Ser. No. 197,565
Int. Cl.[5] A01D *34/02*
U.S. Cl. 56—296 7 Claims



1. A sickle bar for mounting a plurality of adjoining sickle sections along the length of the bar, said sickle bar comprising:

top and bottom bar assemblies each including at least two bars arranged end-to-end;

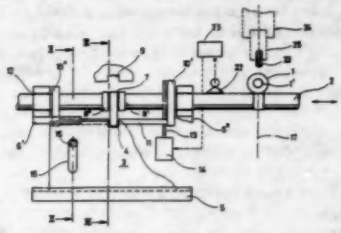
each split between the ends of the bars in one of the bar assemblies being longitudinally offset relative to each split between the ends of the bars in the other bar assembly.

4,942,729

APPARATUS FOR ALIGNING A STRAND SUPPLY DEVICE AND A STRAND GUIDE OF A TEXTILE MACHINE

Hermann Güttler, Uhingen, and Karl-Heinz Mark, Weilheim, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

Filed Sep. 27, 1989, Ser. No. 413,480
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1988, 3832665
Int. Cl.[5] D01H *15/00, 15/013, 5/58, 13/06*
U.S. Cl. 57—261 14 Claims



1. In a textile machine of the type having a supply of a strand of textile material and a device for drafting the strand of textile material, a reciprocable member, a strand guide mounted on the reciprocable member for guiding the strand from the strand supply to the drafting device, means for reciprocating the reciprocable member transversely with respect to the strand during operation of the drafting device to effect reciprocating movement of the strand guide relative to the drafting device during the feed of the strand through the strand guide to the drafting device, and means for initially inserting the strand into the strand guide, an apparatus comprising:

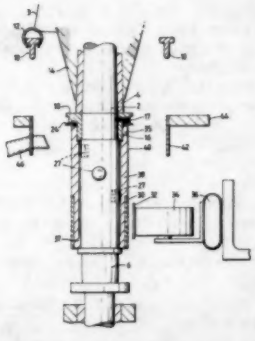
means for aligning the intial strand inserting means and the strand guide with respect to one another in an alignment position at which the strand is initially inserted into the strand guide.

4,942,730

TEXTILE APPARATUS

William A. Morrison, Carnmoney, Northern Ireland, assignor to James Mackie & Sons Limited, Belfast, Northern Ireland

Filed Aug. 16, 1988, Ser. No. 232,712
Claims priority, application United Kingdom, Aug. 17, 1987, 8719416
Int. Cl.[5] D01H *1/38, 9/16, 11/00*
U.S. Cl. 57—303 12 Claims



1. Apparatus for automatically winding yarn onto a first

bobbin positioned on a spindle to form a wound yarn package and for transferring without interruption the yarn from the wound yarn package on the first bobbin to a replacement bobbin positioned on the spindle, said apparatus comprising:

a spindle for carrying a first bobbin, said spindle being rotatable about its axis to enable yarn to be wound on the first bobbin to form a wound yarn package;

a yarn reserve winding member around which yarn is wound prior to doffing the first bobbin containing the wound yarn package from said spindle;

a yarn severing device located adjacent the axis of said spindle and between said yarn reserve winding member and an adjacent portion of said spindle for cutting the yarn connected between the wound yarn package on the first bobbin on said spindle and a winding on said yarn reserve winding member before doffing the first bobbin containing the wound yarn package from said spindle, and for further cutting the yarn connected between the winding on said yarn reserve winding member and an initial winding on a replacement bobbin positioned on said spindle following doffing of the first bobbin containing the wound yarn package from said spindle;

a first drive means operative for providing rotation of said spindle and said yarn reserve winding member in a first direction to form the wound yarn package on the first bobbin, the winding on said yarn reserve winding member and the initial winding on the replacement bobbin; and

a second drive means independently operative of said first drive means for providing rotation of only said yarn reserve winding member in both said first direction and a second direction opposite to said first direction, so that when said yarn reserve winding member is rotated in said second direction independent of said spindle and said first drive means via said second drive means, the yarn connected between the wound yarn package on the first bobbin positioned on said spindle and the winding on said yarn reserve winding member is cut by said yarn severing device prior to doffing the wound yarn package on the first bobbin from said spindle, and when said yarn reserve winding member is rotated in said first direction independent of said spindle and said first drive means via said second drive means, the yarn connected between the winding on said yarn reserve winding member and the initial winding on the replacement bobbin positioned on said spindle is cut by said yarn severing device.

4,942,731

SPINNING METHOD AND SPINNING APPARATUS

Toshifumi Morihashi, Ohtsu; Shoji Sakai, Nagaokakyo; Teruo Nakayama, Ohtsu; Koshi Noda, Joyo, and Michiaki Fujiwara, Kameoka, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 7, 1988, Ser. No. 281,092

Claims priority, application Japan, Dec. 14, 1987, 62-315774

Int. Cl.[5] D01H *13/04*

U.S. Cl. 57—328 **3 Claims**

1. A spinning apparatus, comprising:

a drafting device for drafting a fiber bundle,

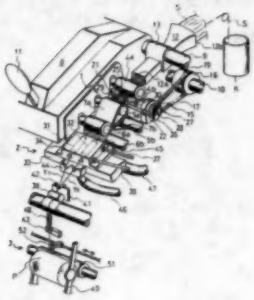
a twisting device for applying a twist to the drafted fiber bundle, the twisting device comprising a pair of false twisters,

a take-up device for taking up yarn delivered from the twisting device,

separating means for separating the fiber bundle into two secondary bundles,

a secondary bundle combining device providing downstream of the separating means,

a fiber bundle guide provided upstream of the drafting device,



wherein the separating means is located between the fiber bundle guide and the drafting device.

4,942,732

REFRACTORY METAL COMPOSITE COATED ARTICLE

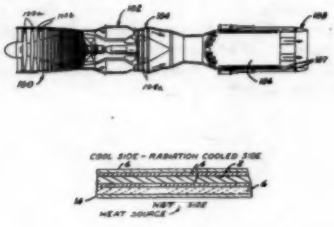
Seymour Priceman, Seaford, N.Y., assignor to Barson Corporation, Troy, Mich.

Division of Ser. No. 86,023, Aug. 17, 1987, Pat. No. 4,889,776.

This application Mar. 13, 1989, Ser. No. 322,648

Int. Cl.[5] F02K *3/10*

U.S. Cl. 60—261 **6 Claims**



1. In an engine using a gas flow past an upstream engine component toward a downstream engine component operating at elevated temperature, the combination of said downstream component comprising a substrate of a refractory metal, an oxidation resistant intermetallic layer on the substrate and a ceramic layer adhering to the intermetallic layer, said upstream component comprising a material potentially destructively reactive with said intermetallic layer so as to degrade same when in contact therewith at elevated temperature, said ceramic layer providing a barrier between said intermetallic layer and said material in the event said material comes in contact with said downstream component so as to prevent degradation of said intermetallic layer.

4,942,733

HOT GAS GENERATOR SYSTEM

Gregory S. Hosford, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 30,724, Mar. 26, 1987, Pat. No. 4,825,650.

This application Nov. 21, 1988, Ser. No. 273,893

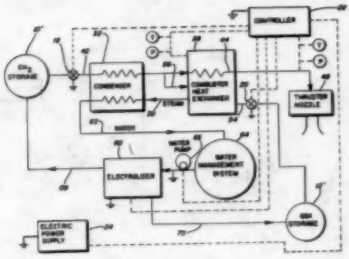
Int. Cl.[5] F02K *9/42*; F02C *3/28*

U.S. Cl. 60—267 **16 Claims**

1. A hot gas generator system, comprising:

combustor means;

condenser means;
means connecting the combustor means to the condenser means for condensing the product of combustion from the combustor means;
hydrogen supply means;
means connecting the hydrogen supply means to the condenser means and then to the combustor means whereby the hydrogen absorbs heat from the combustion product as it condenses and the hydrogen thereby is preheated



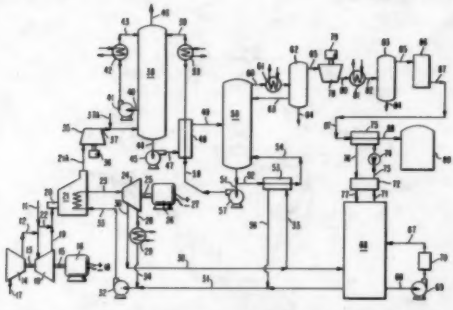
prior to entering the combustor means, and including a first portion for supplying some of the hydrogen to the combustor means for burning therein and a second portion for passing the remainder of the hydrogen through the combustor means for superheating the hydrogen;
oxygen supply means; and
means connecting the oxygen supply means to the combustor means for mixing with the hydrogen therein during combustion.

4,942,734

COGENERATION OF ELECTRICITY AND LIQUID CARBON DIOXIDE BY COMBUSTION OF METHANE-RICH GAS

Stephen J. Markbreiter, Edison; Daniel J. Dessanti, Teaneck, both of N.J., and Hans P. Schorr, Douglaston, N.Y., assignors to Kryos Energy Inc., New York and The Brooklyn Union Gas Company, Brooklyn, both of, N.Y.

Filed Mar. 20, 1989, Ser. No. 326,636
Int. Cl.[5] F02C *6/18*; F25B *27/02*
U.S. Cl. 60—39.02 **18 Claims**



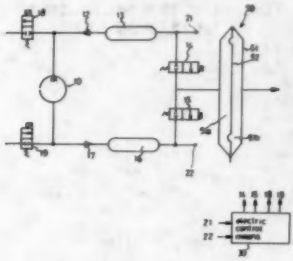
1. A cogeneration system for the production of electricity and liquid carbon dioxide by the combustion of methane-rich fuel gas, which comprises four integrated components:
(1) a gas turbine for the combustion of said fuel gas with excess air at elevated pressure, an electric generator driven by said gas turbine, a high-pressure steam boiler connected to receive and burn the exhaust gases from said gas turbine and an additional quantity of said fuel gas, a steam turbine connected to receive high-pressure steam from said steam boiler, and an additional electric generator driven by said steam turbine;
(2) an amine absorption system for the separation of carbon dioxide from the flue gas produced in said steam boiler of component (1), said absoption system having a stripping column with a reboiler connected to be heated with steam from an intermediate-pressure stage of said steam turbine of component (1);
(3) an ammonia absorption refrigeration unit connected to receive steam from said intermediate-pressure stage of said steam turbine of component (1); and
(4) apparatus to liquefy carbon dioxide released by said stripping column of component (2), which comprises a compressor, cooling and drying means, and a carbon dioxide condenser, all connected in series, and said condenser connected to receive refrigeration from said ammonia absorption refrigeration unit of component (3).

4,942,735

APPARATUS FOR DRIVING A MEDICAL APPLIANCE

Sadahiko Mushika, Ichinomiya, and Akira Suzuki, Nishio, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi and Kabushiki Kaisha Shinsangyokaihatsu, Tokyo, both of, Japan

Filed Sep. 19, 1988, Ser. No. 246,232
Claims priority, application Japan, Sep. 18, 1987, 62-23582
Int. Cl.[5] F16D *31/02*
U.S. Cl. 60—416 **3 Claims**



1. An apparatus for driving a medical appliance comprising:
a positive pressure generating means having an outlet terminal;
a first one-way valve means having an inlet terminal connected to said outlet terminal of said positive pressure generating means;
a first accumulating means connected to an outlet terminal of said first one-way valve means;
a first switching valve means connected to said first accumulating means;
a first pressure sensing means for detecting a pressure between said first one-way valve means and said first switching valve means;
a second switching valve means connected to an outlet terminal of said first switching valve means;
a second accumulating means connected to said second switching valve means;
a second one-way valve means having an inlet terminal connected to said second accumulating means and an outlet terminal connected to an inlet terminal of said positive pressure generating means;
a second pressure sensing means for detecting a pressure between said second switching valve means and said second one-way valve means;
a third switching valve means connected between said pressure generating means and said first one-way valve means for controlling communication of said pressure generating means with the atmosphere;

a fourth switching valve means connected between said pressure generating means and said second one-way valve means for controlling communication of said pressure generating means with the atmosphere;

an isolator means having an inlet connected between said first and second switching valve means and an outlet adapted to be connected to a medical appliance for the alternate application of positive and negative pressures thereto; and

an electronic control means connected to said valve means and said pressure sensing means for opening and closing said first and second switching valve means in accordance with predetermined timings to alternately apply positive and negative fluid pressures to said isolator means, for opening and closing said third and fourth switching valve means in accordance with both positive and negative pressure setting values provided in said electronic control means and output signals from said first and second pressure sensing means and for closing at least one of said third and fourth switching valve means when both of said output signals from said first and second pressure sensing means are above the setting values, respectively for regulating the pressures in said first and second accumulator means.

4,942,736

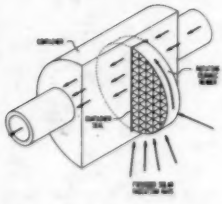
METHOD OF AND APPARATUS FOR PRODUCING POWER FROM SOLAR ENERGY

Lucien Y. Bronicki, Yavne, Israel, assignor to Ormat Inc., Sparks, Nev.

Filed Sep. 19, 1988, Ser. No. 246,149

Int. Cl.[5] F03G *7/02*

U.S. Cl. 60—641.12 **36 Claims**



1. A method for producing power from solar energy comprising the steps of: compressing gas from an ambient source during a first period of time and storing the compressed gas in a storage reservoir: and supplying said compressed gas from the storage reservoir to a gas turbine through a solar collector during a second period time to produce electricity.

4,942,737

DRIVE CONTROL SYSTEM FOR HYDRAULIC CONSTRUCTION MACHINE

Akira Tatsumi, Tokyo, Japan, assignor to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP87/00737, § 371 Date May 31, 1988, § 102(e) Date May 31, 1988, PCT Pub. No. WO88/02441, PCT Pub. Date Apr. 7, 1988

PCT Filed Oct. 2, 1987, Ser. No. 205,321

Claims priority, application Japan, Oct. 5, 1986, 61-236676

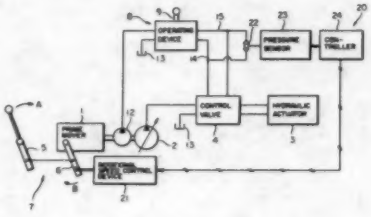
Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—431 **13 Claims**

1. A drive control system for a hydraulic construction machine, comprising a prime mover, a hydraulic pump driven by the prime mover, at least one hydraulic actuator driven by hydraulic fluid discharged from the hydraulic pump, first rotational speed setting means including first operating means for setting rotational speed of the prime mover, and second operating means for controlling operation of the hydraulic actuator, characterized by comprising:

second rotational speed setting means (**20, 24**) associated with the second operating means for outputting a rotational speed control signal increasing the set rotational speed of the prime mover when displacement of the second operating means exceeds a predetermined value; and

rotational speed control means associated with at least the second rotational speed setting means, for validating the



rotational speed set by the first rotational speed setting means (**7; 80**) in a first region in which displacement of the second operating means is at least equal to or less than said predetermined value, and for setting a rotational speed higher than the rotational speed set by the first rotational speed setting means, modified by the rotational speed control signal from the second rotational speed setting means in a second region in which the displacement of the second operating means is larger than the predetermined value.

4,942,738

PNEUMATIC BRAKE BOOSTER PISTON WITH SLEEVE DEFINING QUICK-FILL INPUT CHAMBER

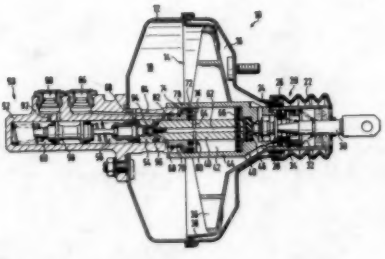
Manfred Kaub, Rhens, Fed. Rep. of Germany, assignor to Lucas Industries public limited company, Birmingham, England

Filed Jul. 30, 1987, Ser. No. 79,530

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1986, 8622758

Int. Cl.[5] B60T *13/10, 13/52, 13/56*

U.S. Cl. 60—550 **14 Claims**



9. A brake pressure booster and master cylinder assembly, comprising:

a booster casing (**12**) in which a movable wall (**14**) separates two compartments (**16,18**) from each other,

a control valve (**20**) which connects the two compartments (**16,18**) with each other when it is in an inoperative position and separates the two compartments (**16,18**) from each other when in an operative position, connecting one

(16) of them to a source of pressure which differs from the pressure in the other compartment (18),

a cylinder casing (52) attached to the booster casing (12), projecting into the same, and containing at least one pressure piston (54) which defines a pressure chamber (56) for pressurizing a brake circuit,

an input piston (40) which has a larger effective surface than said pressure piston (54) and is formed with an integral, sleeve-like envelope (46) defining an input chamber (42) movable together with the movable wall, a relief valve (80) adapted to relieve the input chamber (42) of pressure in case of failure of the brake pressure booster (10), an intermediate piston (70) disposed between said input piston (40) and said pressure piston (54) and including a first part (70a) which is slideably received in said sleeve-like envelope and is sealed thereto by a first seal (72), said intermediate piston (70) having a second part (70b) which is slideably received in said cylinder casing (52) and is sealed thereto by a second seal (74), a spring (78) acting on said intermediate piston (70) urging it to a first position in the direction of said input piston (40), said intermediate piston having a first face (79) exposed to the pressure in said input chamber (42) and an opposed second face (81) exposed to pressure in a space between said first and second seals (72,74), fluid passage means (83) connecting said space to the one of said booster compartments (18) which is under lower pressure than the other compartment (16) when the brake pressure booster (10) is actuated, said intermediate piston (70) being responsive to predetermined differences in relative pressure forces acting on the respective first and second faces (79, 81) to effect movement of said intermediate piston (70) between first and second positions towards and away from said input piston (40), respectively, said intermediate piston (70) having an operative connection with said relief valve (80) whereby said relief valve (80) is opened sooner, in the course of brake actuation if the booster has failed than if it is operative.

4,942,739

MIXING CHAMBER FOR AN AIR-CONDITIONING SYSTEM

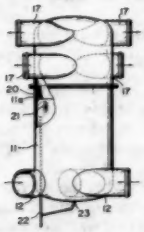
Akira Uda, Kakamigahara; Yoshio Yoshida, Ogaki; Makoto Harada, Minokamo, and Masaaki Sato, Kakamigahara, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha and Japan Aircraft Development Corporation, both of, Japan

Filed Jul. 11, 1989, Ser. No. 378,379

Claims priority, application Japan, Jul. 11, 1988, 63-172448

Int. Cl.[5] F25D *17/06*

U.S. Cl. 62—93 **6 Claims**



1. A mixing chamber for an air-conditioning system comprising a vessel of a cylindrical configuration, inlet port means formed in said vessel at one axial end portion and oriented in a tangential direction with respect to said vessel to introduce air and form a spiral air flow in said vessel, outlet port means formed in said vessel at the other axial end portion to discharge the air, water capturing means provided on an inner wall surface of said vessel to extend circumferentially along said inner wall surface for preventing water on said inner wall surface from flowing beyond said water capturing means toward said other axial end portion of said vessel, opening means formed in said vessel to open to said inner wall surface at a side adjacent to said inlet port means to draw water accumulated on said inner wall surface of said vessel at said side of said water capturing means.

4,942,740

AIR CONDITIONING AND METHOD OF DEHUMIDIFIER CONTROL

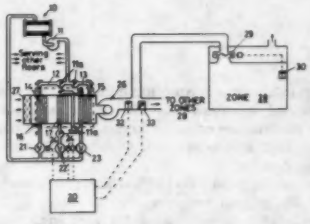
Allan Shaw; Russell E. Luxton, both of 5th Floor, Security House, 233 North Terrace, Adelaide, Australia, and Russell E. Luxton, both of Adelaide, Australia, assignors to Allan Shaw; Russell Estcourt Luxton and Luminis Pty. Ltd., all of Adelaide, Australia

Continuation-in-part of Ser. No. 124,876, Nov. 24, 1987, Pat. No. 4,876,858. This application Mar. 3, 1989, Ser. No. 319,409

Claims priority, application Australia, Nov. 24, 1986, PH 9126

Int. Cl.[5] F25D *17/06*

U.S. Cl. 62—93 **26 Claims**



1. An air conditioner comprising a dehumidifier having a plurality of coil portions,

coolant supply means and coolant flow control means controlling coolant flow from the coolant supply means and through the coil portions selectively in one at least of a plurality of coolant circuits which embody said coil portions, so as to establish a plurality of stages of dehumidifier capacity,

an air flow fan, means controlling air flow from the fan to be through one at least of the coil portions, at least one control sensor located to sense magnitude of load,

and coupling means coupling said sensor to said flow control means in such a way that as load reduces from peak load conditions through part load stages towards minimum load conditions, coolant flow is restricted through one at least of the coil portions but coolant flow rate is increased in another of said coil portions to maintain the required sensible heat cooling capacity, in turn increasing the heat transfer coefficient on the coolant side of a heat exchange interface of said other coil portion thereby reducing the temperature of that interface and in turn increasing the ratio of latent heat cooling to sensible heat cooling of that interface.

4,942,741

REFRIGERANT RECOVERY DEVICE

John P. Hancock, 1545 E. 101st St., Indianapolis, Ind. 46280, and Ralph A. McClelland, 9046 Hadway Dr., Indianapolis, Ind. 46256

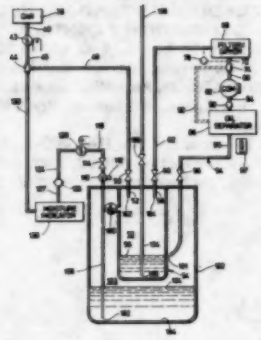
Filed Jul. 3, 1989, Ser. No. 374,821

Int. Cl.[5] F25B *45/00*

U.S. Cl. 62—292 **20 Claims**

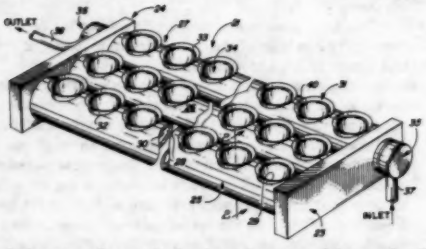
1. A container for use in a refrigerant recovery device, the container comprising:

a refrigerant storage tank having a wall defining an exterior and a generally hollow interior,
a tank inlet means through which refrigerant can flow from the exterior of the tank to the interior of the tank,
a tank outlet means through which refrigerant can flow from the interior of the tank to the exterior of the tank,
a contaminant canister for separating contaminants from refrigerant and for storing the contaminants so separated,



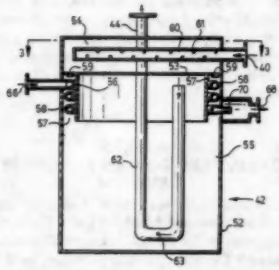
the contaminant canister including a wall defining an interior and an exterior, and being disposed substantially within the interior of the refrigerant storage tank,
a canister inlet means through which refrigerant can flow into the canister,
a canister outlet means through which refrigerant can flow out of the canister and
a contaminant removal means for removing contaminant from the canister.

4,942,742
ICE MAKING APPARATUS
Sergio G. Burruel, 5635 W. Verde La., Phoenix, Ariz. 85031
Filed Apr. 23, 1986, Ser. No. 855,140
Int. Cl.[5] F25C 1/22
U.S. Cl. 62—347 **9 Claims**



4. A system for producing ice cubes comprising: a plurality of generally elongated, substantially hollow fluid conducting conduit means each having a longitudinal axis, at least one longitudinal conduit surface, a first end portion, a second end portion opposite said first end portion, fluid inlet means operatively connected to one of said first end portions and one of said conduit means and one of said second end portions on a different one of said conduit means, fluid outlet means operatively connected to the ends of said conduit means opposite to the ends connected to said fluid inlet means, said conduit means being disposed so that the longitudinal axis thereof are disposed in spaced generally parallel relationship to each other; a supply of fluid refrigerant means; means for circulating said fluid refrigerant means simultaneously to said inlet means of each said conduit means, through the hollow interior thereof, and out of said outlet means thereof for return to said fluid refrigerant supply means; a supply of heated fluid heat exchange means; means for circulating said fluid heat exchange means simultaneously to said inlet means of each said conduit means, through the hollow interior thereof and out of said outlet means thereof for return to said fluid heat exchange means supply; a supply of water; water flow-directing means operatively disposed relative to said conduit means for directing a flow of water along said conduit surface; means for feeding water from said water supply to said flow directing means; a plurality of ice-forming pockets operably disposed in the surface of each of said conduit means to receive said water from said water flow directing means therewithin; control means for selectively and simultaneously circulating said fluid refrigerant means through each of said conduit means for freezing the water deposited within said pocket means for producing ice cubes therein and for selectively and simultaneously circulating said heated fluid exchange means through each of said conduit means for partially thawing the outer surface of said ice cubes and dislodging said ice cubes from said pockets for gravitational emptying prior to beginning the next ice forming cycle.

4,942,743
HOT GAS DEFROST SYSTEM FOR REFRIGERATION SYSTEMS
Charles Gregory, 1348 #5 Highway, Burlington, Ontario, Canada L7R 3X4
Filed Nov. 8, 1988, Ser. No. 268,412
Int. Cl.[5] F25B 43/00
U.S. Cl. 62—503 **43 Claims**



29. A refrigeration system comprising:
a refrigerant compressor;
a cooling coil having an inlet and an outlet;
an expansion device for expanding and cooling refrigerant connected between the compressor and the cooling coil inlet;
a controllable defrost control valve connected to the compressor outlet to receive hot compressed refrigerant fluid therefrom;
and a liquid refrigerant vaporizing accumulator connected to the coil for vaporizing liquid fluid issuing from the coil outlet to prevent its delivery to the compressor inlet, the vaporizing accumulator comprising:
a body member,
a partition member within the interior of the body member and dividing the interior into first and second chambers;
an inlet to the first chamber for connection into the refrigeration system so as to receive the refrigerant fluid exiting from the coil under defrost and to produce turbulence therein as it enters the first chamber;
a plurality of bores in the partition connecting the interiors of the two chambers, constituting the only outlet for all of the refrigerant fluid rom the first chamber, and for the passage of the turbulent refrigerant fluid from the first chamber to the second chamber;
a heat exchange pipe of heat conductive material disposed in the second chamber adjacent the said plurality of bores for

its surface to be impinged by the turbulent refrigerant fluid passing through the bores for vaporization of any liquid refrigerant entrained therein;

an inlet to the heat exchange pipe and an outlet therefrom for connection into the refrigeration system to receive and to deliver respectively hot refrigerant fluid received from the compressor; and

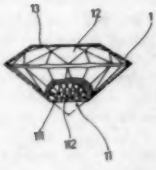
an outlet from the second chamber for all of the refrigerant fluid into an accumulator outlet pipe within the second chamber.

4,942,744

SELF-SHINING ARTIFICIAL JEWELRY DEVICE

Hsu C. Wei, Rm. 602, 6F, No. 75, Roosevelt Rd., Sec. 2 Taipei, Taiwan

Filed Feb. 3, 1989, Ser. No. 306,519
Int. Cl.[5] A44C *17/02*
U.S. Cl. 63—26 **2 Claims**



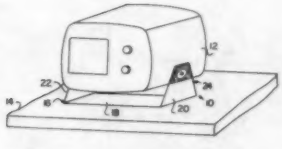
1. A sparkling jewelry device comprising a jewel having a cavity therein, said cavity having an inner surface provided with a plurality of light-reflecting facets, said jewel having an exterior surface provided with a plurality of light-reflecting facets, a colored coating disposed over said exterior light-reflecting facets, and a light-generating element disposed in said cavity for directing light rays upon both of said light-reflecting facets and through said colored coating; and a socket for mounting said jewel and said light-generating element, said socket having a plurality of corrugated reflective surfaces for reflecting additional light rays toward both of said light-reflecting facets.

4,942,745

LOCKING SECURITY ARRANGEMENT

Gregory A. Jacobs, and Merrill G. Neal, both of Redondo Beach, Calif., assignors to Yacht-Yok, A California Partnership, Hermosa Beach, Calif.

Filed Jul. 18, 1989, Ser. No. 381,592
Int. Cl.[5] E05B *73/00*
U.S. Cl. 70—58 **10 Claims**



1. An arrangement for securing a piece of equipment to a securing surface comprising the combination of:

a securing surface;

a piece of equipment having a housing;

a bracket assembly mounted on the securing surface; and

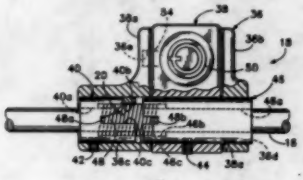
a key-operated lock assembly non-rotatably mounted within the bracket assembly and having a shaft disposed within a mating aperture in the housing of the piece of equipment, the shaft of the lock assembly being capable of removal from the housing of the piece of equipment only with the use of a key.

4,942,746

ANTI-THEFT AUTO LOCKING DEVICE WITH SPRING CLUTCH

Jacob G. Mouroy, 4143-A Warner Blvd., Burbank, Calif. 91505

Filed Oct. 17, 1989, Ser. No. 422,767
Int. Cl.[5] E05B *65/12*
U.S. Cl. 70—238 **6 Claims**



1. A device for preventing the theft of a vehicle having a driver's compartment with a first member movable for operation of the vehicle and a second member spaced from the first member, said device comprising:

first engaging means for securely engaging the first member;

elongate bar means fixedly attached to the first engaging means and having a length sufficient to extend adjacent to the first and second members, the bar means having at least a cylindrical portion posed adjacent the second member when the first engaging means engages the first member;

second engaging means, captured slidingly on the cylindrical portion of the bar means, for securely engaging the second member;

spring means disposed around the bar and having first and second spring ends, the first spring end being attached to the second engaging means in a manner preventing rotation of the first spring end about the bar relative to the second engaging means; and

lock means for locking the second spring end in a securing position relative to the first spring end whereby the spring means is under tension around the bar, thereby frictionally inhibiting movement of the spring means along the bar, the locking means being operable for releasing the spring means from the securing position and allowing rotation of the second spring end around the bar relative to the first spring end sufficient to remove the tension of the spring means on the bar, thereby allowing movement of the spring means, and therefore the second engaging means, along the bar.

4,942,747

OPERATOR LOCKOUT PREVENTION DEVICE

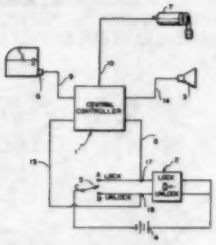
Douglas A. Pianow, Laguna Hills, Calif., assignor to Universal Photonix, Inc., Laguna Hills, Calif.

Filed Oct. 14, 1988, Ser. No. 257,551
Int. Cl.[5] E05B *47/00*
U.S. Cl. 70—263 **10 Claims**

1. In a motor vehicle including an ignition lock, a power door lock mechanism, first sensor means for generating a first electric signal when an ignition key is in said ignition lock, second sensor means for generating a second electric signal whan a door of the motor vehicle is open, and switch means movable from a lock position to an unlock position for causing said power door lock mechanism to selectively lock and unlock a lock for said door, said switch means closing a locking circuit when in said lock position and an unlocking circuit when in said unlocking position, the improvement comprising:

detection means for generating a locking signal when said locking circuit has been closed by said switch means;

a central controller including logic circuit means connected to each of said first and second sensor means, and to said detection means for generating a third electric signal



whenever said first and second electric signals are simultaneously generated by said first and second sensor means, and said locking circuit is simultaneously closed; and

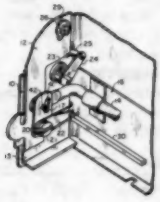
means for transmitting said third electric signal to said unlocking circuit to cause said power door lock mechanism to unlock said door.

4,942,748

SECURITY MECHANISM FOR TELEPHONE PAYSTATIONS

Gerald B. McGough, Huntsville, Ala., assignor to Palco Telecom Inc., Nashville, Tenn.

Filed Jun. 9, 1989, Ser. No. 364,093
Int. Cl.[5] E05B *11/00*
U.S. Cl. 70—389 **8 Claims**



1. A security arrangement for a telephone paystation upper housing, including a cylinder lock, a locking bar engageable by said lock, a torsion bar, and latch means secured to said locking bar and to said torsion bar, said latch means comprising:

a latch plate, including a first opening;

said latch plate further including a second opening, including at least two communicating areas angularly related to each other;

a bearing plate;

a first projection extending from said bearing plate through said first opening facilitating rotational motion of said latch plate around said first projection from said bearing plate;

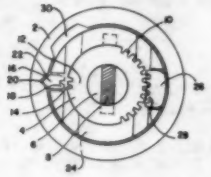
and a projection from said locking bar normally extending through a first one of said communicating areas in said latch plate and in response to vertical movement of said locking bar resulting from engagement by said cylinder lock, said locking bar projection moved into a second one of said communicating areas whereby said locking bar is inhibited from further vertical embodiment.

4,942,749

INTERCHANGEABLE KEY LOCK WITH ROLLING TUMBLERS

Jacob Rabinow, 6920 Selkirk Dr., Bethesda, Md. 20817

Filed Jun. 26, 1989, Ser. No. 371,114
Int. Cl.[5] E05B *63/00*
U.S. Cl. 70—495 **9 Claims**



1. A lock in which a first key is initially the correct key so that the lock may be opened by the first but not a second key, and wherein after the lock has been opened by the first key the second key may be placed in the lock whereupon the second key becomes the correct key for unlocking the lock and the first key is no longer the correct key and will not unlock the lock, comprising:

a sidebar comprising means for locking and unlocking the lock,

tumbler means settable to open the lock by said first key, said sidebar being the lock opening means movable to a lock-opening position when said tumbler means has been set to open the lock by the correct key, and

setting changing means for changing, when said sidebar is in said lock open position, the setting of said tumbler means upon the mere insertion of the second key in the lock, so that said second key now becomes the correct key for opening the lock,

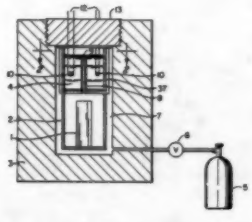
said tumbler means comprising at least one single piece tumbler, the geometry of each tumbler remaining the same irrespective of the key that is inserted into the lock.

4,942,750

APPARATUS AND METHOD FOR THE RAPID ATTAINMENT OF HIGH HYDROSTATIC PRESSURES AND CONCURRENT DELIVERY TO A WORKPIECE

Robert M. Conaway, Columbus, Ohio, assignor to Vital Force, Inc., Columbus, Ohio

Filed Jan. 23, 1989, Ser. No. 338,222
Int. Cl.[5] B21P *26/10*
U.S. Cl. 72—56 **3 Claims**



1. A method for the processing of a workpiece with high temperatures and high pressures comprising the steps:

(a) placing said workpiece into a first thermally insulated chamber, wherein said first chamber has a means therein for heating said workpiece in a controlled manner;

(b) heating said workpiece in said first chamber to the desired temperature;

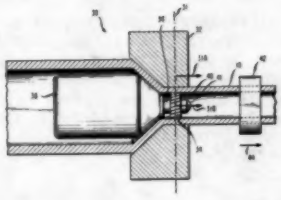
(c) concurrently with step b, inserting into a second thermally insulated chamber, a heating means in thermal contact with a sufficient quantity of expansible fluid to cause a pressure rise upon expansion in said first chamber and said second chamber to the desired processing pressure for said workpiece, wherein said expansible fluid causes a chemical reaction when in contact with said workpiece, inducing chemical changes in said workpiece;
(d) joining said first and said second chambers by means of a hollow connecting tube, said tube having an impermeable pressure-opening inlet device isolating said first and said second chambers;
(e) inserting said first and said second chambers, as joined in step d, into a pressure-containment vessel;
(f) introducing sufficient heat into said heating means to open said inlet device and raise the pressure in both chambers to the desired value, bringing said expansible fluid into contact with said workpiece, causing thereby chemical changes to occur in said workpiece;
(g) holding the combination of said first and said second chambers, as connected, at the required temperature and pressure for the required length of time;
(h) reducing said pressure;
(i) removing said combination of said first and said second chambers from said pressure-containment vessel;
(j) reducing the temperature of said workpiece and removing said workpiece from said first chamber.

4,942,751

PROCESS AND APPARATUS FOR FORMING INTERNALLY ENHANCED TUBING

Francis J. Fuchs, Jr., Naples, Fla., assignor to R. Gale Rhodes, Jr., Rumson, N.J., a part interest

Filed Oct. 13, 1989, Ser. No. 422,984
Int. Cl.[5] B21C *37/20*
U.S. Cl. 72—68 **10 Claims**



1. Process of forming internally enhanced tubing, comprising the steps of:
forming the internal portion of tubing into a plurality of inwardly extending spiral fins having a first radial length; and lengthening said spiral fins to a second radial length greater than said first radial length.

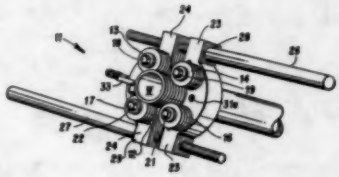
4,942,752

APPARATUS FOR REFORMING AND RESTORING THE SURFACE OF A CYLINDRICAL WORKPIECE MANUALLY

Sheldon Helfman, 496 Orange Ave., West Haven, Conn. 06516

Continuation of Ser. No. 863,871, May 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 777,486, Sep. 19, 1985, abandoned. This application Sep. 26, 1988, Ser. No. 251,025
Int. Cl.[5] B23G *7/02*; B21H *3/04*
U.S. Cl. 72—70 **9 Claims**

1. A device for manually working the surface of a cylindrical metallic workpiece to selectively increase the effective diameter of the workpiece and to reform and restore threads thereon comprising a pair of oppositely disposed C-shaped brackets defining a work receiving opening therebetween for surrounding the work when disposed therein, each of said C-shaped brackets having a plurality of spaced openings therein, said openings in one bracket opposing and being aligned with openings in the other bracket, a plurality of metal forming rollers each having swaging threads on their outer surface, said swaging rollers having opposite end portions, each of said end portions being provided with identical pilot thread sections having pilot swaging threads of progressively increasing crest diameter extending respectively from opposite ends of said rollers inwardly to an intermediate swaging thread section having swaging threads of constant crest diameter to permit thread reforming when said rollers are mounted with either of said roller end portions positioned outwardly of and spaced from said brackets, means for removably securing each of said



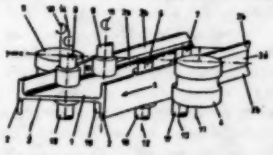
rollers in a selected opening to obtain a variable dispositional array of the rollers and their engagement with a workpiece disposed in said work receiving opening, to thereby accommodate the device to workpieces of different diameters, said removable securing means including a stub shaft extending through a bore in each of said rollers and extending into one of said openings in said C-shaped brackets, a pair of openings provided in each bracket disposed normal to said stub shaft openings, and opposing handle means extending through said pairs of openings for securing the C-shaped brackets together about the work, whereby the handles can be engaged to move the metal working rollers toward and away relative to the workpiece and the surface of the metallic workpiece is worked manually by grasping the handle means and rotating the C-shaped brackets and associated rollers about the workpiece.

4,942,753

PROCESS AND APPARATUS FOR ROLLING STRUCTURAL SHAPES

Horst Willeke, Salzgitter, Fed. Rep. of Germany, assignor to Salzgitter AG, Berlin, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 311,608
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1988, 3805364
Int. Cl.[5] B21B *1/12*
U.S. Cl. 72—178 **26 Claims**



1. Process for finishing an overall shape, said overall shape having at least a first shape segment and at least a second shape segment which are joined at an approximately right angle junction therebetween, said process comprising the steps of:
roughing said first and said second shape segments to final dimensions with said second shape segment including at least a portion thereof being outwardly bent with respect to a remainder of said second shape segment and said junction;
bending said at least a portion of said second shape segment to be aligned with said remainder of said second shape

segment and oriented at a right angle with respect to said first shape segment;

said bending including directing compression roll means inwardly toward a section of said second shape segment and against said portion at said section without supporting an immediately opposite section of said second shape segment directly opposed to said compression roll means; and

supporting at least one of said first shape segment and said second shape segment at locations remote from said section of said second shape segment with additional roll means during said bending to prevent undesired bending of said first shape segment and said second shape segment away from said overall shape.

4,942,754

ARRANGEMENT FOR AXIALLY DISPLACING ROLLS IN ROLLING MILL STANDS

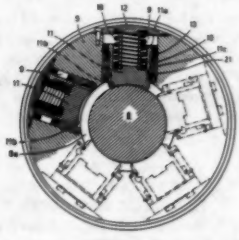
Ulrich Patzelt, Kreuztal, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft

Filed May 18, 1988, Ser. No. 195,210

Claims priority, application Fed. Rep. of Germany, May 20, 1987, 3716901

Int. Cl.[5] E21B *31/18*

U.S. Cl. 72—247 **3 Claims**



1. In an arrangement for axially displacing rolls in rolling mill stands, wherein the rolls of the rolling mill stand are supported in rolls supports including bearings which are axially slidable within the roll supports, the supports being adjustably and slidably guided in roll housings of the stand, the rolls being displaceable by means of hydraulic piston-cylinder units which are supported relative to the roll housings and are connected to the supports of the bearings of the rolls, a sliding guide being arranged on the roll support for a sliding carriage which supports a coupling device for a roll neck, the roll neck having an annular groove, the hydraulic piston-cylinder units being articulated to the sliding carriage, the coupling device including drive members which are slidable in radial guides and can be placed in the annular groove of the roll neck, the coupling device being supported by a neck bushing of a deep-groove-type radial roller bearing which is immovably arranged in the sliding carriage, the neck bushing having radially extending guide bores, the improvement comprising the drive members including skirt-type pistons, means for guiding the skirt-type pistons in the radially extending guide bores within the neck bushing, spring means for biasing the skirt-type piston in a direction toward the roll neck and pressure medium means for biasing the skirt-type pistons in the opposite direction.

4,942,755

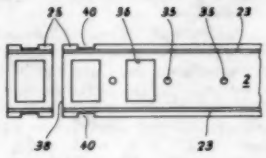
WATCHCASE SUPPORT FASHIONED FROM A CONTOURED STRIP

Paul Gogniat, Bienne, Switzerland, assignor to ETA SA Fabriques d'Ebauches, Switzerland

Filed Dec. 21, 1988, Ser. No. 287,305

Int. Cl.[5] B23P *13/00*

U.S. Cl. 72—254 **20 Claims**



1. A method of making a wristwatch case support, said method comprising the steps of:

forming a contoured strip exhibiting a profile in relief, said profile in relief comprising repeating segments extending in the longitudinal direction of said strip;

shaping said strip while leaving said profile in relief unchanged in at least one zone of each of said repeating segments, said shaping including at least the forming of at least one recess in said strip within each of said repeating segments configured to receive a wristwatch case, whereby each of said segments comprises a wristwatch case support; and,

separating said repeating segments subsequent to said shaping,

whereby said profile in relief is present in each of said supports after said separation.

4,942,756

MULTI-JAW FORMING PRESS ESPECIALLY SUITED FOR DETAILS OF VARIABLE SECTIONS

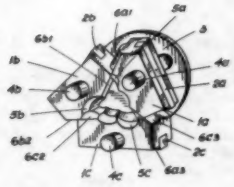
Jan Charzewski, ul. Batuty 7/619, 02-743 Warszawa, Poland

Continuation-in-part of Ser. No. 748,553, Jun. 25, 1985, abandoned. This application Feb. 12, 1988, Ser. No. 158,080

Claims priority, application Poland, Jul. 18, 1984, 248802

Int. Cl.[5] B21D *41/04*

U.S. Cl. 72—399 **3 Claims**



1. A multi-jaw forming press for forming objects the surface of which includes joined together sections, pairs of adjoining sections defining a line at the border therebetween, said press comprising:

movable jaws arranged around an axis of the press and lying in a common plane perpendicular to said axis,

each of said jaws having a guiding surface and a profiled working surface opposite thereto shaped to define a surface section of the object being formed, each said working surface terminating in edges corresponding in shape to respective ones of the border lines of the section to be defined by the working surface,

each of said jaws being movable in sliding contact with an adjacent jaw along a lateral surface of each said adjacent

jaw, each said lateral surface adjoining one of the edges of the working surface of the jaw of which it is a part, and each said lateral surface being formed of parallel generating lines passing through its associated adjoining edge,

a rigid system of guides, the guiding surface of each of said jaws being slidably engaged with said guides for movement there along in preselected directions,

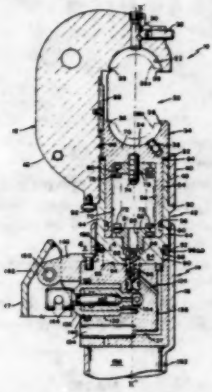
connectors embedded in said jaws, and a driver centered on said connectors driving said jaws through said connectors.

4,942,757

HYDRAULIC PRESS WITH INFINITE HEAD ROTATION

Gennaro L. Pecora, Manchester, N.H., assignor to Burndy Corporation, Norwalk, Conn.

Filed Mar. 31, 1989, Ser. No. 332,341
Int. Cl.[5] B21J *9/12*; B23P *11/00*
U.S. Cl. 72—453.16 **6 Claims**



1. An hydraulic crimping tool comprising a die head subassembly, a pump housing, and operating handles, the die head having an upper jaw for receiving and retaining a first crimping die, a hub affixed to the die head, and a piston and cylinder assembly received by the hub and secured thereto against relative rotation, the piston fitted into the cylinder and having a ram head for receiving a second crimping die cooperating with the upper jaw die for crimping workpieces, the piston having an interior cavity for receiving pressurized fluid for advancing the piston ram during crimping operation, the cylinder having an open bottom wall for directing hydraulic fluid to the piston cavity, the pump housing having an upper surface for receiving the cylinder bottom wall defining a rotational interface between die head and pump housing, an interface port extending through the pump housing across the rotational interface into the cylinder bottom wall opening, the die head and pump housing being mounted for rotation with respect to each other, and means for securing the die head and pump housing against axial movement with respect to each other while accommodating rotation of the head with respect to the pump housing.

4,942,758

HIGH SPEED LEAK TESTER

Dennis H. Cofield, 2817 Roy Pace, El Paso, Tex. 79935

Filed Dec. 4, 1986, Ser. No. 937,887
Int. Cl.[5] G01M *3/26*
U.S. Cl. 73—49.2 **12 Claims**

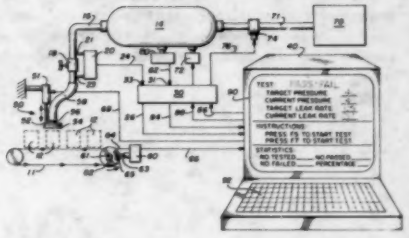
1. A computerized leak tester system for rapidly testing a work piece for fluid leaks comprising:

a. a continuously regulated pressure supply;

b. a valve having a continuously opened restrictive orifice therethrough for producing non-laminar flow;

c. means for coupling said continuously regulated pressure supply to a test piece through said valve such that said work piece is both pressurized and tested through said valve;

d. a differential pressure transducer connected across said valve for producing an analog signal in response to a differential pressure created by non-laminar fluid flow and detected across said valve;



e. an analog to digital conversion means for receiving said signal from said differential pressure transducer and for converting it into a digital signal;

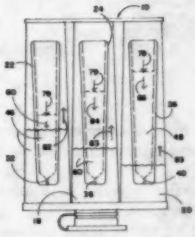
f. a digital computer for receiving said digital signal representing said differential pressure value from said converter and for converting said differential pressure value into a flow rate value and for comparing said flow rate value to a predetermined flow rate value representing a maximum allowable leak rate.

4,942,759

VISCOSITY TESTING APPARATUS

Howard L. Beers, North Fort Myers, Fla., assignor to HF Scientific, Inc., Ft. Myers, Fla.

Filed Aug. 31, 1989, Ser. No. 401,030
Int. Cl.[5] G01N *11/06*
U.S. Cl. 73—56 **17 Claims**



1. A viscosity test apparatus comprising:

a reference chamber partially filled by a predetermined volume of a reference liquid having a known viscosity;

a test chamber attached to said reference chamber and including means for partially filling said test chamber with a test liquid having a volume and a viscosity/temperature characteristic that are substantially similar to those of said reference liquid;

an elongate first conducting column including an open upper end that interconnects said reference chamber and said first column and a lower end having first orifice means that are submersible in said reference liquid for conducting said reference liquid under a pressure head between said first column and said reference chamber; and

a second conducting column mounted within said test chamber in substantial alignment with said first column and

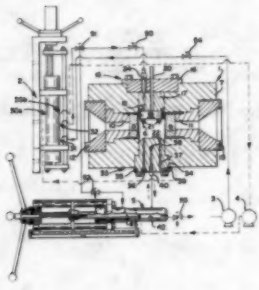
having dimensions substantially identical to said first column, said second column including an open upper end that interconnects said test chamber and said second column, and a lower end having second orifice means that are submersible in said test liquid for conducting test liquid under a pressure head between said second column and said test chamber, said reference and test chambers being simultaneously manipulable to provide said reference and test liquids with respective pressure heads such that the respective levels of the reference liquid and said test liquid in said first and second columns may be compared instantaneously, to provide a measure of viscosity of said test liquid.

4,942,760

APPARATUS FOR THE MEASUREMENT OF INTERFACIAL TENSION

Jaime Almeida, Caracas, Venezuela, assignor to Intevep, S.A., Venezuela

Filed Mar. 28, 1989, Ser. No. 329,581
Int. Cl.[5] G01N *13/02*
U.S. Cl. 73—64.4 **10 Claims**



1. An apparatus for measuring interfacial tension between a gas phase and a liquid phase of a fluid by the pendant drop method comprising:

a visual cell defining a cavity capable of supporting high pressures and temperatures;

plural drop forming means in said cell for forming drops of various sized and comprising a plurality of capillaries of varying sizes positioned within said cavity together with selective positioning means actuatable from outside of said cell for selectively positioning any of said capillaries into fluid-tight communication with an injection means for introducing a drop of the liquid phase into capillary positioned in registry therewith while maintaining existing superatmospheric pressure within the cell; said selective positioning means comprising a substantially horizontal capillary-bearing turret rotatably mounted in said cell, wherein said capillaries are spaced from one another and circularly arranged on said turret substantially parallel to one another, and a shaft secured to said turret and projecting out of said cell and operable to rotate said turret;

recirculation means for recirculating the fluid phases through the cell; and

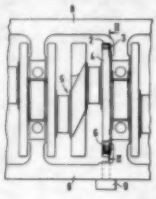
means for modulating the pressure within the cell.

4,942,761

SENSING ARRANGEMENT FOR MEASURING THE ROTATIONAL SPEED OF A ROTATABLE SHAFT HAVING A CRANK

Manfred Batzill, Neuhausen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed May 11, 1989, Ser. No. 350,347
Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816114
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—119 R **9 Claims**



1. A scanning arrangement comprising:

a rotational-speed sensor; and

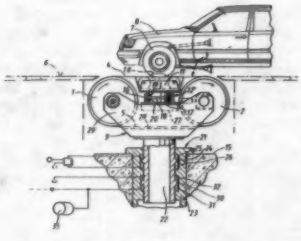
a toothed scanning ring for supplying rotational-speed signals to a shaft, particularly at the crankshaft of an internal-combustion engine, the teeth of the scanning ring affecting the rotational-speed sensor, wherein the scanning ring has a radial through-gap means for permitting a radially bent opening of the ring to extend over a cylindrical part of the crankshaft, and connecting means for form-fittingly connecting the ring with the part after mounting.

4,942,762

FLAT UNIT FOR MOTOR VEHICLE TEST BEDS

Karl Schober, Weinstadt, and Norbert Schaub, Remseck, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Sep. 5, 1989, Ser. No. 402,565
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1988, 3830048
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—117 **18 Claims**



1. A flat-track unit for motor vehicle test beds comprising:

a roadway-simulating endless belt loop means guided over two rollers for accommodating a vehicle wheel on its upper test side and orientated roughly horizontally at a ground level;

wherein the two rollers are mounted in a frame, supported in a vertically floating manner by a spring mounting, and mechanically guided in the vertical direction,

a rectilinear shoe means provided between the rollers for supporting the test side of the belt in a guiding or rolling

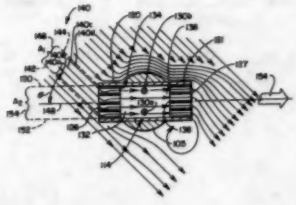
manner at a contact region where a vehicle wheel is to be located;
wherein said rectilinear supporting shoe means is vertically movable relative to the frame by a vertically orientated hydraulic shoe excitation cylinder;
wherein said vertically orientated hydraulic excitation shoe cylinder acts centrally on the frame and is excited to develop vertical oscillations for simulating roadway vibrations;
wherein one of the two rollers is Connected via a universal-joint shaft to a drive and braking unit for simulating traction and braking forces;
wherein the drive and braking unit is spaced from and in a vertically immovable position next to the frame and has the same axis as the one roller;
wherein the floating spring mounting of the frame is provided by hydropneumatic spring means supported and rigidly connected to a foundation;
a shoe excitation cylinder located completely inside an area of the belt loop and rigidly supported at its bottom by the frame;
wherein the shoe excitation cylinder is vertically excited by only short-stroke and high-frequency oscillations simulating roadway vibrations;
wherein the frame is excited to develop vertical oscillations by a hydraulic frame excitation cylinder rigidly connected between a control bottom portion on the frame and the foundation; and wherein
said hydraulic cylinder is excited by only the long-stroke, low-frequency oscillations simulating roadway vibrations.

4,942,763

FLOW SENSOR ASSEMBLY

Joseph W. Harpster, 11450 Overbrook Ln., Galena, Ohio 43021

Filed Mar. 23, 1988, Ser. No. 172,030
Int. Cl.[5] G01F *5/00*
U.S. Cl. 73—202.5 **36 Claims**



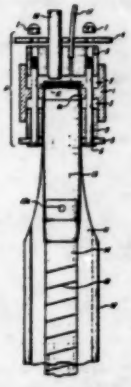
1. Apparatus for determining the mass transport of fluid within a conduit, said fluid having a mass transport vector along the axis of said conduit, said mass transport vector being derived from localized components of fluid flow each exhibiting a local flow velocity vector, comprising:
sampling conduit means having a flow axis, positioned within said conduit and having an entrance opening of area extent selected to confront and sample an incident front area of fluid representing a said localized component of fluid flow and said component of fluid flow exhibiting a said local flow velocity vector incident to said flow axis at an angle θ, for admitting that portion of said component as sampled fluid flow;
entrance partitioner means comprising a plurality of conduits positioned within said sampling conduit means, each having a principal cross-sectional dimension, and extending therein a predetermined length from said entrance opening to an end location, said predetermined length being selected as a multiple of said principal dimension effective to intercept discrete portions of said component of fluid flow and alter the direction of flow thereof to a direction substantially parallel with said sampling conduit means flow axis and exhibiting a velocity substantially corresponding with the product of said local flow velocity vector and the cosine of said angle θ;
flow sensor means mounted with said sampling conduit means and responsive to said sampled fluid flow for deriving an output signal corresponding therewith; and
means defining a flow chamber intermediate said flow sensor means and said entrance partitioner means end location for effecting the derivation of a substantially uniform profile of velocity of said sampled fluid flow at said flow sensor means.

4,942,764

MOUNTING HEAD FOR A RESISTANCE-TAPE LEVEL SENSOR

Edwin P. Dews, Hampton Falls, N.H.; William E. Pierce, Winchendon, Mass.; John A. Gunnarson, Concord, Mass., and Albert D. Ehrenfried, Maynard, Mass., assignors to Metritape, Inc., Littleton, Mass.

Filed Mar. 17, 1989, Ser. No. 325,139
Int. Cl.[5] G01F *23/00*; H02G *15/22*
U.S. Cl. 73—301 **14 Claims**



1. A mounting head for a resistance tape sensor comprising:
a cylindrical body of rigid material having an upper cavity portion and a lower cavity portion;
a cylindrical tongue of rigid material coaxially disposed in the lower portion of the body and operative to retain a resistance-tape sensor;
a first deformable elastomeric element disposed in the upper cavity portion;
electrical coupling means disposed through the first deformable elastomeric element and connectable to the sensor to be installed through the cylindrical tongue;
gas coupling means disposed through the firs deformable elastomeric element and coupleable to the interior of the sensor to be installed within the cylindrical tongue;
a second deformable elastomeric element disposed in the lower cavity portion and surrounding and in engagement with the tongue;
a top plate disposed over an end surface of the first deformable elastomeric element;
a bottom plate disposed around the tongue and an end surface of the second deformable elastomeric element; and
fastening means for drawing the top plate and bottom plate together to cause deformation of the first and second deformable elastomeric elements to seal all leakage paths into the mounting head.

10. A sensor mounting head in combination with an elongated tape-like sensor disposable within a vessel containing a fluent material the level of which is to be monitored, and operative in response to the pressure of materials surrounding

the immersed sensor to provide an electrical resistance proportional to material level, comprising:

a rigid tube supporting a confronting end of an elongated tape-like sensor;

electrical coupling means in the rigid tube electrically connected to the sensor;

gas coupling means in the rigid tube and in fluid coupling with the interior of the sensor;

a deformable elastomeric material surrounding a portion of the rigid tube;

an outer shell enclosing at least partially the deformable elastomeric material;

retaining means at respective ends of the outer shell and operative to contain the elastomeric material and to generate high internal compressive forces on the rigid tube;

the electrical coupling means and gas coupling means having portions extending from the interior of the rigid tube to a position external of the head.

4,942,765

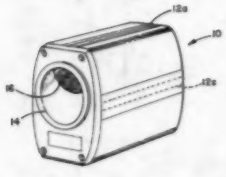
ULTRASONIC VELOCITY SENSOR

Thomas K. Hiniker, N. Mankato, and Semor D. Tofte, Mankato, both of Minn., assignors to Micro-Trak Systems, Inc., Mankato, Minn.

Division of Ser. No. 175,777, Mar. 31, 1988. This application Nov. 28, 1988, Ser. No. 276,768

Int. Cl.[5] G01L *19/14*

U.S. Cl. 73—431 **6 Claims**



1. A container for a velocity sensor which is adapted to be mounted on an agricultural vehicle comprising:

(a) a housing having a plurality of linear mounting channels defined therein, said channels being adapted for slidably receiving a mounting projection or projections secured to an agricultural vehicle said linear mounting channels being positioned such that they are aligned with the direction of travel of the vehicle when said housing is mounted to the vehicle; and

(b) a transducer for transmitting and receiving pulses, said transducer mounted in said housing and directed such that signal is transmitted by said transducer at a predetermined angle with the line of travel of the vehicle when said housing is secured to the vehicle by the linear mounting channels.

4,942,766

TRANSDUCER

John C. Greenwood, Harlow, and James M. Naden, Dartford, both of Great Britain, assignors to STC PLC, London, England

Filed Nov. 3, 1988, Ser. No. 266,818

Claims priority, application United Kingdom, Mar. 26, 1988, 8807273

Int. Cl.[5] G01L *9/14*

U.S. Cl. 73—704 **5 Claims**

1. A sensor device for the remote measurement of pressure, the device comprising:

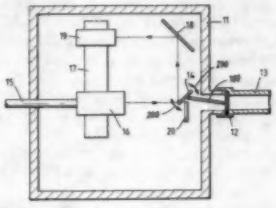
a closed pressure tight housing;

a flexible pressure responsive diaphragm associated with the housing;

a torsional resonator mounted within the housing and having frequency determining means mechanically coupled to the diaphragm whereby in use the resonator frequency corresponds to a pressure applied to the diaphragm;

means for directing a light beam on to said resonator whereby to provide a first light signal modulated with the resonator frequency;

means for transmitting the first modulated signal to a remote station;



means associated with said resonator for providing from said light directing means a second light signal modulated with the resonator frequency;

photovoltaic means adjacent said resonator and arranged to receive said second modulated light signal and to generate a oscillatory electrical current in response thereto; and

electromagnetic feedback means associated with the torsional resonator and coupled to the photovoltaic means whereby in use the resonator is maintained in an oscillatory condition at its resonant frequency.

4,942,767

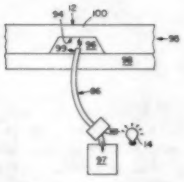
PRESSURE TRANSDUCER APPARATUS

Joseph H. Haritonidis, Brookline; Stephen D. Senturia, Boston; David J. Warkentin, and Mehran Mehregany, both of Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 932,780, Nov. 19, 1986. This application Jun. 2, 1989, Ser. No. 360,325

Int. Cl.[5] G01D *5/34*; G01L *7/08, 9/00*

U.S. Cl. 73—705 **6 Claims**



1. A pressure transducer comprising:

a diaphragm;

a source of coherent light;

an optic fiber assembly coupled to the diaphragm and having at least one single mode optic fiber with an end facing the diaphragm and an opposite end coupled to the source for receiving coherent light, the fiber end facing the diaphragm being fixed across a gap therefrom and splitting a coherent light beam carried by the fiber into a transmitted part and a reference part, the transmitted part being emitted from the fiber end across the gap to the diaphragm and reflected therefrom back to the fiber end, the reference part being formed by locally reflecting off the fiber end in a direction back through the fiber, the transmitted part after being reflected off the diaphragm intersecting the reference part at the fiber end, the intersection of parts forming an interference light wave indicative of dia-

phragm deflection and carried by the fiber in a direction away from the fixed fi[illegible]r end; and

detection means including light detecting means, coupled to the fiber for receiving the interference light wave, and the detection means providing an indication of diaphragm deflection.

4,942,768

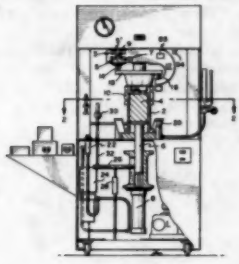
PAVING MATERIAL TESTING MACHINE

John L. McRae, P.O. Box 1109, Vicksburg, Miss. 39180

Filed Jun. 6, 1989, Ser. No. 362,283

Int. Cl.[5] G01N *3/00*

U.S. Cl. 73—795 **10 Claims**



1. In a materials testing machine of the type having a mold chuck mounted for gyratory oscillation for subjecting a sample of paving material to controlled shear strain and controlled normal stress, the improvement comprising means for varying the rate of shear and for controlling the temperature of the sample for evaluation of the effect of viscosity in the sample.

4,942,769

METHOD OF TESTING CORES

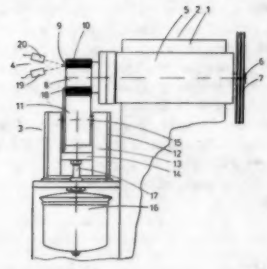
Markku S. Järvinen, Huutjärvi; Mikael J. H. Nováky, and Heikki P. J. Rommi, both of Karhula, all of Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Sep. 8, 1988, Ser. No. 241,478

Claims priority, application Finland, Sep. 21, 1987, 874103

Int. Cl.[5] G01N *19/00*

U.S. Cl. 73—82.1 **19 Claims**



1. A method of testing, by dynamic loading simulating real life conditions, the loading capacity of a core manufactured by reeling and gluing from paper or board layers, the core mounted on a chuck, and utilizing a roll, said method comprising the steps of:

(a) loading the core mounted on a chuck by exerting a nip pressure on the core with the roll;

(b) rotating the core in contact with the roll;

(c) changing one or both of the loading and rotational speed over time in a predetermined manner; and

(d) detecting any changes in the structure of the core.

4,942,770

AUTOMATIC ASEPTIC SAMPLING APPARATUS

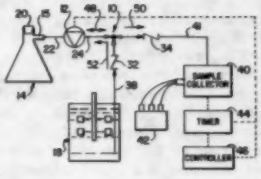
Gunilla K. E. Seifert, R.R. #4, Merrickville, Ontario, Canada (K0G 1N0), and Paul P. Matteau, 806-333 Chapel St., Ottawa, Ontario, Canada K1N 8Y8

Filed Jul. 24, 1989, Ser. No. 383,625

Claims priority, application Canada, Sep. 1, 1988, 576514

Int. Cl.[5] G01N *1/14*

U.S. Cl. 73—864.34 **10 Claims**



1. An apparatus for taking liquid samples from a container, comprising:

(a) a three-way valve having a first port communicating with the container, a second port and an outlet port,

(b) a waste liquid vessel,

(c) a reversible pump communicating on one side thereof with the second port and with the waste liquid vessel on a second side of the pump,

(d) a first flow control means associated with the first port for only permitting the flow of liquid therethrough from the container to said three-way valve, and

(e) a second flow control means associated with the outlet port for only permitting the discharge of liquid therethrough from said three-way valve.

4,942,771

MAGNETOSTRICTION TYPE TORQUE SENSOR

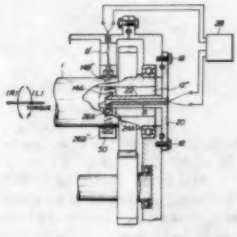
Masaki Sugimoto, Yokosuka; Kunihiko Morikawa, Fujisawa; Nobuteru Hitomi, Yokohama; Kenji Ikeura, Zushi; Hisashi Kitahara, Yokosuka; Hiroyuki Hirano, Fujisawa, and Kazuhiro Takatori, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 15, 1988, Ser. No. 206,722

Claims priority, application Japan, Jun. 15, 1987, 62-148285; Jun. 15, 1987, 62-148286

Int. Cl.[5] G01L *3/10*

U.S. Cl. 73—862.36 **6 Claims**



3. A torque sensor for sensing the torque in a rotatable body, comprising:

means defining a first set of grooves in a surface of said rotatable body, said first grooves defining a plurality of

first projections therebetween, said first grooves and said first projections being arranged at a first predetermined angle with respect to the axis of rotation of said rotatable body, said first projections undergoing one of compression and elongation when a torque is applied to said rotatable body;

a first coil, said first coil being mounted on a first yoke which juxtaposes said first set of grooves, said first coil being operatively connected with a control circuit which includes a source of alternating current;

means defining a second set of grooves in a surface of said rotatable body, said second set of grooves defining a plurality of second projections which are arranged at a second predetermined angle with respect to the axis of rotation of said rotatable body, said second projections undergoing the other of compression and elongation when said torque is applied to said rotatable body;

a second coil, said second coil being mounted on a second yoke which juxtaposes said second set of grooves, said second coil being connected with said control circuit;

wherein said first and second sets of projections are magnetically permeable and such that when subject to compression the permeability is reduced and the amount of magnetic flux which passes therethrough is reduced, and when subject to elongation the permeability is increased and the amount of magnetic flux which passes therethrough is increased; and

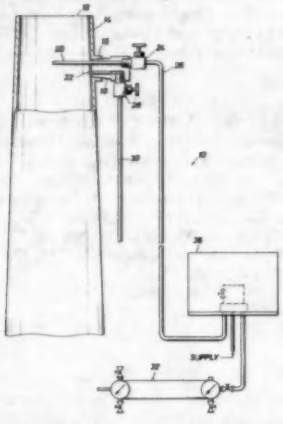
wherein said first and second sets of grooves are defined on different surfaces of said rotatable body.

4,942,772

STACK SAMPLING SYSTEM

Thomas F. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Jun. 19, 1989, Ser. No. 368,418
Int. Cl.[5] G01N *1/24*
U.S. Cl. 73—863.83 **12 Claims**



1. A system for obtaining a proportioned sample from a stack discharge gas flow, the system comprising:

(a) an elongate stack sample line extending along a stack to upper portions thereof and connecting to a probe positioned in the upper portions of the stack and having an inlet opening, said probe receiving thereinto a sample of the stack discharge gas flow, and wherein said line delivers the sample to the base area of the stack;

(b) cyclically operated sample removing means for periodically and repetitively removing a portion of the sample from said stack line wherein the removed portion is delivered through a sample outlet line;

(c) storage means connected with said sample outlet line, said storage means comprising a chamber for receiving and holding gases therein to fill said storage means to a specified volume and including valve means for isolating the same therein to permit removal thereof for transfer to another location; and

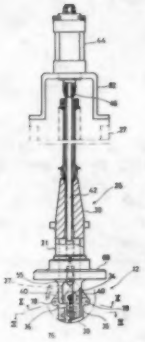
(d) means for timing operation of said sample removing means, said means incorporating a controllable timer and further including a timer controlled valve means for periodic operation of said sample removing means.

4,942,773

DEVICE FOR SAMPLING STEEL MATERIAL

Kaizo Okamoto; Akira Ichihara; Akimune Sato; Kenji Hirata; Katsuhisa Hirayama; Eiji Hina; Shigeru Nakaji; Minoru Sakamoto, all of Kawasaki-dori Kurashiki; Takashi Tanaka, Kobe, and Keizo Shimizu, Akashi, all of Japan, assignors to Kawasaki Steel Corp., Hyogo and Nippon Air Brake Co., Ltd., Kobe, both of, Japan

Division of Ser. No. 79,142, Jul. 28, 1987, Pat. No. 4,833,930.
This application Mar. 21, 1989, Ser. No. 326,726
Claims priority, application Japan, Feb. 10, 1987, 62-29370
Int. Cl.[5] G01N *1/08*
U.S. Cl. 73—864.45 **2 Claims**



1. A device for sampling a block sample directly from the surface of a continuously cast steel piece on a roller table, comprising:

a cutting tool device consisting of an inverted mountain type facing tip that cuts the surrounding of a cylindrical center portion into dish form while leaving said cylindrical center portion uncut, and a curved lever type tip for cutting the root of said cylindrical center portion, said inverted mountain type facing tip and said curved lever type tip being set on the same holder, a center axis of said holder being located horizontally and parallel to a running direction of said roller table, and

a moving device for moving said cutting tool device when in a free position in any of 3 orthogonal directions, namely (A) horizontally parallel to, (B) horizontally rectangular to and (C) perpendicular to the direction of running of said roller table.

4,942,774

ANISOKINETIC SHROUDED AEROSOL SAMPLING PROBE

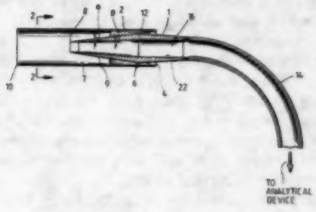
Andrew R. McFarland, College Station, Tex., assignor to The Texas A & M University System, College Station, Tex.

Filed Mar. 20, 1989, Ser. No. 325,987
Int. Cl.[5] G01N *1/00*
U.S. Cl. 73—864.81 **10 Claims**

1. A method of taking samples from a flowing stream of fluid for analyzing the concentration of particulate matter in said flowing stream, comprising the steps of:

a. aerodynamically decelerating a portion of said flowing stream;

b. anisokinetically removing a sample of the decelerated fluid; and,



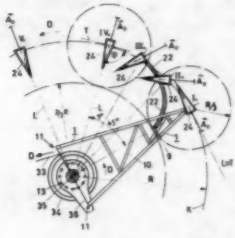
c. analyzing the sample to determine the concentration of particulate matter contained therein.

4,942,775

METHOD OF AND DEVICE FOR ACCELERATING TEST PIECES ON A CIRCULAR PATH

Martin Monkewitz, Lucerne, and Erich Oppliger, Heimberg, both of Switzerland, assignors to Schweizerische Eidgenossenschaft, Emmen, Switzerland

Filed May 8, 1989, Ser. No. 348,608
Int. Cl.[5] G01N *3/00*
U.S. Cl. 73—865.3 **14 Claims**



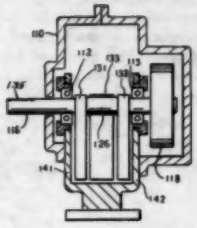
1. A method for the controlled build-up of a stipulated acceleration of a test piece on a circular path, the direction of acceleration being constant at least during the start-up phase with respect to the test piece, wherein in the region of its center of acceleration the test piece (24) is rotated by at least 90° perpendicular to the tangential direction of its circular path (K), and at the beginning of the start-up phase of the rotary motion (D) in the circular path (K) the test piece (24) is aligned in its longitudinal axis (L) tangential to the circular path (K), and during the start-up phase the test piece (24) is rotated with its longitudinal axis (L) towards the center point (35) of the circular path (K), and after a stipulated angle of rotation (ϕ) this test piece (24) is aligned on the circular path (K) with its longitudinal axis (L) radially towards the main shaft (35) of the circular path (K) and experiences a stationary rotational phase in this position.

4,942,776

NON-METALLIC GEAR SHAKER

Michael J. Quirk; Timothy E. Drake, both of Westfield, N.Y., and John E. Zarycki, North East, Pa., assignors to Renold, Inc., Westfield, N.Y.

Filed Apr. 17, 1989, Ser. No. 339,226
Int. Cl.[5] F16H *33/20*; B06B *1/16*
U.S. Cl. 74—61 **6 Claims**



1. A gear coupled counter rotating shaker comprising a housing,

said housing having a first side part and a second side part,

an input gear on said second end of said input shaft,

a third eccentric weight on said intermediate part of said output shaft,

said third eccentric weight being disposed between said first eccentric weight and said second eccentric weight,

an output gear on said second end of said output shaft engaging said input gear,

said third bearing being disposed on said housing adjacent said third eccentric weight,

said fourth bearing being disposed on said output shaft between said third eccentric weight and said output gear,

a one piece input shaft and a one piece output shaft,

said input shaft being received in said first bearing and said second bearing,

said output shaft being supported in said third bearing and said fourth bearing,

a first eccentric weight and a second eccentric weight,

said input shaft having a first end, a second end and an intermediate part,

said output shaft having a first end, a second end and an intermediate part,

said first eccentric weight being supported on said intermediate part of said input shaft,

said second eccentric weight being supported on said intermediate part of said input shaft,

said first eccentric weight and said second eccentric weight are disposed between said first side part of said housing and said second side part of said housing.

4,942,777

DEVICE FOR CYCLICALLY VARYING THE PHASE RELATIONSHIP BETWEEN TWO ROTATING SHAFTS

Morton E. Fife, 3307 Kyle Ave. North, Golden Valley, Minn. 55422

Filed Mar. 13, 1989, Ser. No. 322,572
Int. Cl.[5] F16H *35/06*
U.S. Cl. 74—397 **6 Claims**

1. Apparatus for effecting cyclical accelerations and decelerations in a driven shaft in response to rotating a drive shaft at a constant velocity, including:

a drive shaft and a means for rotating the drive shaft about a fixed longitudinal drive axis, and a drive gear mounted concentrically on said drive shaft for rotation with said drive shaft;

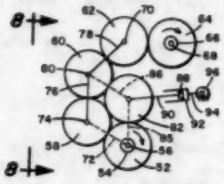
a driven shaft rotatable on a longitudinal driven shaft fixed relative to said drive axis, and a driven gear mounted

concentrically on said driven shaft for rotation with said shaft; and

a drive linkage means for drivably engaging said drive gear and said driven gear, and including:

a first intermediate gear rotatable about a longitudinal first axis, and a first connecting means rotatably mounted to said drive gear and said first intermediate gear, for maintaining said drive gear and first gear in driving engagement while maintaining a fixed distance between the drive axis and the first axis;

a second intermediate gear rotatable about a longitudinal second axis, and a second connecting means rotatably mounted to said first gear and said second gear for maintaining said first gear and said second gear in driving engagement while maintaining a fixed distance between said first and second axes;



a third connecting means rotatably connected to said second gear and said driven gear, for maintaining said second gear and driven gear in driving engagement while maintaining a fixed distance between said second axis and said driven shaft axis; and

a moving means including a transversely reciprocable element connected to an associated one of said first and second intermediate gears for controllably and transversely reciprocating said associated gear while said drive gear rotates, to transversely reciprocate said first and second intermediate gears and their associated axes, and thereby dynamically alter a phase relationship between said drive gear and said driven gear.

4,942,778

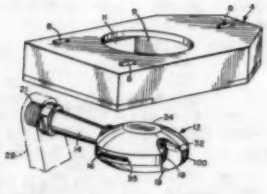
CLIPLESS BICYCLE PEDAL SYSTEM

Richard M. Bryne, 2172 Pine St., San Diego, Calif. 92103

Filed Jul. 10, 1989, Ser. No. 377,223

Int. Cl.[5] G05G 1/14

U.S. Cl. 74—594.6 **23 Claims**



1. A clipless bicycle pedal system for releasably binding the sole of a rider's shoe to a pedal which comprises:

a pedal comprising:

an axle fixedly attached to the end of a crank arm of a bicycle; and

a block rotatably mounted on said axle, said block having a top, a bottom and a circumferential edge, said top and said bottom each being a generally convex surface, said block being generally circular in the lateral plane with said circumferential edges joining said top to sid bottom and a leading edge and a trailing edge oppositely disposed within said circumferential edge, and having a plurality of grooves formed in said circumferential edge of said pedal and aligned with longitudinal and lateral planes of a bicycle on which said pedal system is mounted, at least one of said grooves toward said trailing edge of said pedal block and one toward said leading edge; and

a cleat comprising:

a plate member to be fixed to said sole of said rider's shoe and projecting downwardly therefrom, said plate member having a concave recess therein which generally corresponds to a portion of said convex surface of said pedal block, said convex pedal surface being disposed in said concave recess when said plate member is brought into contact with said pedal block;

a plurality of engaging means, each engaging means comprising a tongue portion adapted to be removably seated in one of said grooves in said pedal block; and

urging means cooperating with said tongue portion of said engaging means to releasably secure said rider's shoe to said pedal.

4,942,779

PLANETARY GEAR TRAIN FOR AUTOMATIC TRANSMISSION

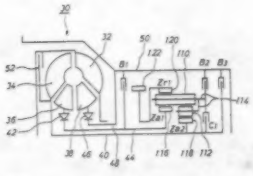
Masahiro Ohkubo, Kadomo, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Division of Ser. No. 39,141, Apr. 16, 1987, Pat. No. 4,869,128. This application May 31, 1989, Ser. No. 359,255

Claims priority, application Japan, Apr. 30, 1986, 61-101504; Apr. 30, 1986, 61-101505; Apr. 30, 1986, 62-101506; May 1, 1986, 61-101446

Int. Cl.[5] F16H 47/04

U.S. Cl. 475—39 **13 Claims**



1. In an automatic transmission wherein a Ravineaux's planetary gear train including a single row planetary gear and a double row planetary gear both having one planetary carrier in common, is disposed at a rear stage of a four-element torque converter comprising two stators, a turbine and a pump; a planetary gear train of the automatic transmission including a turbine shaft connecting the turbine to a sun gear meshing with the double row planetary gear, a stator cylindrical shaft connecting a first stator to a sun gear meshing with the single row planetary gear, a first brake for limiting rotation of the stator cylindrical shaft, and a second brake for limiting rotation of the planetary carrier, thus an output being able to be taken out from a ring gear meshing with the single row planetary gear.

4,942,780

HST(HYDROSTATIC TRANSMISSION) HOUSING AXLE DRIVING APPARATUS

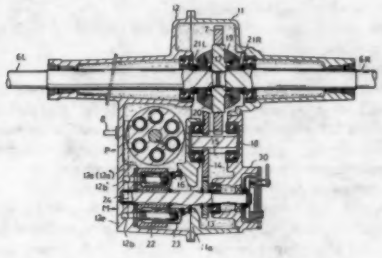
Koichiro Fujisaki; Ryota Ohashi, both of Kobe, and Shusuke Nemoto, Yao, all of Japan, assignors to KANZAKI KOKYUKOKI MFG., CO. LTD., Japan

Continuation of Ser. No. 212,017, Jun. 27, 1988. This application Aug. 23, 1989, Ser. No. 397,960

Claims priority, application Japan, Jun. 26, 1987, 62-160653; Jun. 27, 1987, 62-160689

Int. Cl.[5] F16H 47/04

U.S. Cl. 475—83 2 Claims



1. An axle driving apparatus comprising:
an axle housing, said axle housing being divided into a first axle casing and a second axle casing;
a differential gear unit disposed within said axle housing;
a first axle disposed within said first axle casing;
a second axle disposed within said second axle casing;
a hydraulic pump disposed within said axle housing, said hydraulic pump having a pump shaft which is disposed perpendicular to said first and second axles;
a hydraulic motor disposed within said axle housing, said hydraulic motor having a motor shaft which is disposed in parallel to said first and second axles;
a motor gear fixed to said motor shaft;
a speed reduction transmission for drivingly connecting said motor gear and said differential gear unit;
said speed reduction transmission and said differential gear unit being disposed within said second axle casing;
said hydraulic pump and said hydraulic motor being disposed within said first axle casing;
said hydraulic pump being disposed on a bottom wall of said first axle casing between said first axle and said hydraulic motor;
said hydraulic motor being disposed at an inner side wall of said first axle casing; and
means for transferring oil between said hydraulic pump and said hydraulic motor.

4,942,781

DIFFERENTIAL PLANEL GEAR UNIT

Kouhei Hori, Chigasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

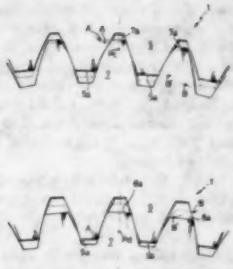
Filed Jan. 6, 1989, Ser. No. 294,019

Claims priority, application Japan, Jan. 6, 1988, 63-000404

Int. Cl.[5] F16H 1/32, 55/08

U.S. Cl. 475—342 5 Claims

1. A differential planet gear unit, comprising:
a sun gear;
planet gears engaged with the sun gear;
a first ring gear having a first number of teeth; and
a second ring gear having a second number of teeth,
the first tooth number being different from the second tooth number, the first and second ring gears coaxially aligning and simultaneously engaging with first and second tooth portions of each planet gear, respectively, diameters of addendum circles of the teeth of the first ring gear and the first tooth portion of each planet gear being different from those of the second ring gear and the second tooth portion



of each planet gear, respectively, to reduce a difference between an approaching contact length and a receding contact length along a contact action line of each of the planet gears and one of the first and second ring gears.

4,942,782

REVERSE SHIFT CONTROL DEVICE ON AUTOMATIC TRANSMISSION

Yoshinari Kuwayama, Tokoname; Fumitomo Yokoyama, Anjo, and Masakatsu Miura, Kariya, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Aichi, Japan

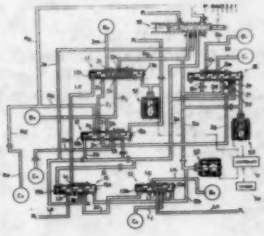
PCT No. PCT/JP87/00454, § 371 Date Mar. 1, 1988, § 102(e) Date Mar. 1, 1988, PCT Pub. No. WO88/00304, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 30, 1987, Ser. No. 172,721

Claims priority, application Japan, Jul. 1, 1986, 61-154695

Int. Cl.[5] B60K 41/10

U.S. Cl. 74—866 5 Claims



1. In an automatic transmission of a vehicle having a transmission gear mechanism including a plurality of rotatable components and through which transmission gear mechanism power is transmitted in a respective one of power transmitting paths defined therethrough, frictional engaging means operatively connected to the transmission gear mechanism for selecting the power transmitting path through which power is transmitted in the transmission gear mechanism, said frictional engaging means including a third brake, hydraulic servos operatively connected to the frictional engaging means for operating or releasing or for engaging or disengaging the frictional engaging means, a plurality of shift valves operatively hydraulically connected to the hydraulic servos and a source of line pressure and which shift valves are movable between respective positions at which the line pressure is supplied toward the servos and respective positions at which the supply of line pressure is interrupted during forward travelling of the vehicle to provide different speeds which can be output by the transmission while the vehicle is travelling for-

ward, and a manual valve operatively hydraulically connected in the transmission between the source of line pressure and the shift valves and which manual valve is settable to a plurality of ranges including reverse, a reverse shift control device comprising:

a respective one of said shift valves that is movable to respective positions during forward travelling of the vehicle to provide different speeds which can be output by the transmission while the vehicle is travelling forward;

said third brake being operatively connected to one of said components for braking a normal and a reverse rotation of said one of said components when said third brake is operated; said third brake being operated when the vehicle is travelling in reverse;

one of the hydraulic servos to which said one of said shift valves is operatively hydraulically connected, said one of the hydraulic servos operatively connected to said third brake;

said one of said shift valves having a first port in direct open hydraulic communication with said manual valve, line pressure being supplied directly to said first port from said manual valve when said manual valve is set to said reverse range, and said one of said shift valves having a second port in hydraulic communication with said one of the hydraulic servos, line pressure passing from said second port to said one of the hydraulic servos when said third brake operatively connected to said one of the hydraulic servos is to be operated,

said one of said shift valves being movable between a first position at which said first and said second ports are open to one another and a second position at which said first and said second ports are closed to one another,

solenoid valve means operatively connected to said one of said shift valves for causing said one of said shift valves to move between said positions thereof; and

control means operatively connected to said solenoid valve means for controlling said solenoid valve means to cause said one of said shift valves to move to said second position thereof when said manual valve is set to said reverse range while the vehicle is travelling at a speed higher than a predetermined speed.

4,942,783

TRANSMISSION RATION CONTROL SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

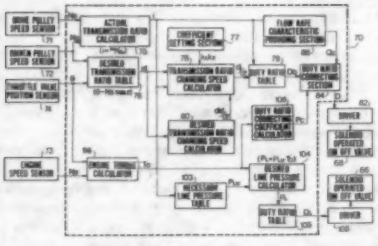
Yoshihiko Morimoto, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 88,060, Aug. 21, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 339,864

Claims priority, application Japan, Aug. 23, 1986, 61-197494

Int. Cl.[5] B60K *41/14*

U.S. Cl. 74—866 **8 Claims**



1. In a control system for a continuously variable transmission for transmitting the power of an internal combustion engine, the transmission having a drive pulley including a hydraulically shiftable first d[i]sc and a hydraulic cylinder for operating the first disc, a driven pulley including a hydraulically shiftable second disc and a hydraulic cylinder for operating the second disc, and a belt engaged with both pulleys, the control system having a first hydraulic circuit having a line pressure control valve with a spool and ports to control a line pressure, a transmission ratio control valve with a spool and ports to control a transmission ratio of the transmission and a pump supplying oil to the hydraulic cylinder of the drive pulley through the transmission ratio control and line pressure control valves and to the hydraulic cylinder of the driven pulley controlled by the line pressure control valve, the improvement in the control system which comprises:

sensing means for sensing operating conditions of the engine and the transmission and for producing sensing signals dependent on the conditions;

shift means responsive to the sensing signals for shifting the spools of each control valve;

actual transmission ratio calculating means responsive to the sensing signals for calculating an actual transmission ratio and for producing an actual transmission ratio signal;

desired transmission ratio calculating means responsive to the sensing signals for calculating a desired transmission ratio and for producing a desired transmission ratio signal;

transmission ratio changing rate calculating means responsive to the actual transmission ratio signal and the desired transmission ratio signal for calculating a transmission ratio changing rate to operate the shift means and for producing a transmission ratio changing rate signal;

engine torque calculating means responsive to the sensing signals for calculating an engine torque and for producing an engine torque signal;

torque ratio calculating means responsive to the engine torque signal for calculating a torque ratio factor;

flow rate characteristic providing means responsive to the actual transmission ratio signal for producing a flow rate characteristic signal; and

correcting means responsive to an output signal of the torque ratio calculating means and to the flow rate characteristic signal for correcting the transmission ratio changing rate signal so that the actual transmission ratio substantially coincides with the desired transmission ratio, so as to prevent hunting or overshooting of the operating conditions of the engine and transmission.

4,942,784

TRANSMISSION CONTROL SYSTEM FOR THE AUTOMATIC TRANSMISSION OF AUTOMOTIVE VEHICLES FOR GEAR TRAIN LOCKING UPON UNINTENDED ACCELERATION

Hirofumi Okahara, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 17, 1988, Ser. No. 258,529

Claims priority, application Japan, Oct. 15, 1987, 62-260545

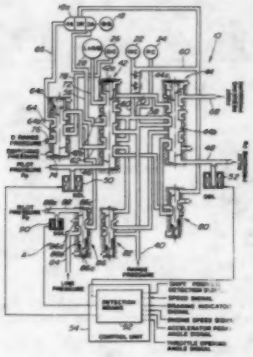
Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—866 **10 Claims**

1. A transmission control system for an automatic transmission of a vehicle, including a plurality of gears selectively engaged by a plurality of frictional elements in a gear train which are engaged or released by a hydraulic pressure control device characterized by:

means for monitoring an emergency condition wherein an unintended sudden acceleration of said vehicle occurs when vehicle speed is less than a predetermined value,

said monitoring means generating a signal indicate of said emergency condition;



means for locking said gear train by engaging a predetermined combination of said frictional elements in response to said signal from said monitoring means.

4,942,785

ARRANGEMENT FOR AN AUTOMATIC SHIFTING OF AN EPICYCLIC, SHIFTABLE TRANSMISSION OF A MOTOR VEHICLE

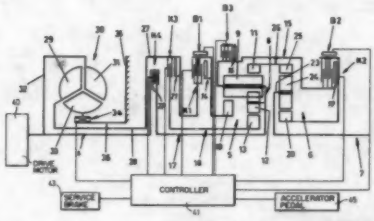
Gunter Jürgens, Waiblingen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Filed Nov. 30, 1988, Ser. No. 277,973

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1987, 3740781

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—867 9 Claims



1. An arrangement for an automatic shifting of an epicyclic, shiftable transmission of a motor vehicle, the transmission having transmission elements which are selective engaged by frictional shift elements operated by pressure medium actuators to form at least a forward starting gear and a reverse starting gear of the transmission, the arrangement including, in series in a power train:

an input shaft which is driven from a drive motor;

a first epicyclic transmission section;

a second epicyclic transmission section;

an output shaft which is coupled to vehicle wheels:

an uninterruptible, torsionally rigid drive connection between a transmission element of the first transmission section and a transmission element of the second transmission section, the input shaft being in drive connection with the first transmission section when the transmission is in gear and the power train between the input shaft and the output shaft being interrupted when the transmission is in a neutral position, a single coupling shaft forming the torsionally rigid drive connection between the first and second transmission sections;

means for initiating a first engagement phase when the transmission is in the neutral position and one of the starting gears is preselected in which a transmission element operating as a reaction in the preselected starting gear and at least one further transmission element of the first transmission section, which can be brought into drive connection with the input shaft, are stalled and the second transmission section, which is brought into drive connection with the output shaft is held in a driveless state; and

means for initiating a second engagement phase when a speed of the input shaft approaches zero, in which both a transmission element of the second transmission section which operates as a reaction in the starting gear and is brought into drive connection with the output shaft is stalled and the torque transmissiblity between the input shaft and output shaft rises gently from zero with ending of the braked state of gear elements not operated as a reaction in the starting gear, by control of a working pressure in shift actuators involved in forming a step down of the starting gear.

4,942,786

CONTINUOUSLY VARIABLE TRANSMISSION SYSTEM WITH BY-PASS CHECK VALVES

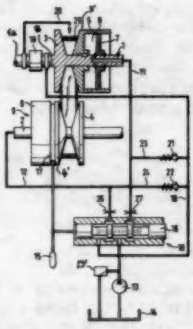
Otto Dittrich, Bad Homburg, Fed. Rep. of Germany, assignor to Reimers Getriebe AG, Zug, Switzerland

Filed Feb. 23, 1989, Ser. No. 314,545

Claims priority, application Fed. Rep. of Germany, May 24, 1988, 3817532

Int. Cl.[5] B60K *41/16*

U.S. Cl. 74—867 4 Claims



1. Continuously variable transmission system having

a first shaft (1, 51);

a second shaft (2, 52),

one of said shafts forming a driving shaft and the other of said shafts forming a driven shaft;

a pair of conical disks (3, 3'; 4, 4') on each of said shafts, said conical disks having facing conical surfaces,

one (3', 4') of the disks of the pairs being axially movable with respect to the other;

connecting means (25) operable between the conical surfaces of the disks and connecting the pairs of the disks, and hence the driving and the driven shafts;

fluid pressure means (5, 7, 8, 6, 9) coupled to the axially movable disk for providing axial pressure thereon to tightly frictionally engage the connecting means (25) between said conical surfaces;

a torque sensor (19; 69, 70) on the driving shaft, the torque sensor controlling the fluid pressure in the fluid pressure means (5, 7, 8, 6, 9) in dependence on torque being trans-

ferred between the driving shaft and the associated pair of conical disks; and

a fluid circulating loop including a source of fluid pressure (13), a control valve (10, 50), the fluid pressure means (5, 7, 8, 6, 9), the torque sensor (19; 69, 79), a fluid sump or drain (14, 20) and connecting lines

(a) between the source of fluid pressure (13) and the control valve (10, 50);

(b) (11, 12; 61, 62) between the control valve (10; 50) and the fluid pressure means (5, 7, 8, 6, 9);

(c) (18; 65, 75, 218) between the control valve (10, 50) and the torque sensor (19; 69, 70); and

(d) (20) between the torque sensor and the fluid sump or drain,

wherein the pressure and fluid flow through said lines (c) and (d) is representative of torque being transferred through said transmission system,

and comprising, in accordance with the invention,

a rapid supply means for rapidly changing the fluid pressure applied to the fluid pressure means (5, 7, 8, 6, 9) without subject to time delays due to flow resistances in said loop, said rapid supply means including

additional fluid supply lines (23, 24; 73, 74) and check valves (21, 22; 71, 72) included in said additional fluid supply lines,

said additional fluid supply lines (23, 24; 73, 74), with the check valves (21, 22; 71, 72) therein, being connected

(e) between the line (18, 65, 75, 218) connecting the control valve (10, 50) and the torque sensor (19; 69, 70) with the connecting line (11, 12; 61, 62) between the control valve (10; 50) and the fluid pressure means (5, 7, 8, 6, 9) to supply additional fluid under pressure to the fluid pressure means upon sensing of increased torque transfer in said system and consequent decreased or blocked fluid flow through connecting line (d) (20) between the torque sensor and the fluid sump or drain,

the check valves having a fluid path direction from the torque sensor line control valve (18; 65, 75, 218) to the control valve-fluid pressure means line (11, 12; 61, 62) and bypassing the control valve (10; 50).

4,942,787

APPARATUS FOR AND METHOD OF CONTROLLING HYDRAULIC CLUTCH OPERATION IN AN AUTOMATIC TRANSMISSION

Takashi Aoki; Satoshi Terayama, Tokyo; Yoshihisa Iwaki, Saitama; Noboru Sekine, Saitama; Hiroyuki Shimada, Saitama; Nobuo Takemasa, Saitama, and Junichi Miyake, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1989, Ser. No. 318,128

Claims priority, application Japan, Mar. 3, 1988, 63-50337; Mar. 3, 1988, 63-50338

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—867 **13 Claims**

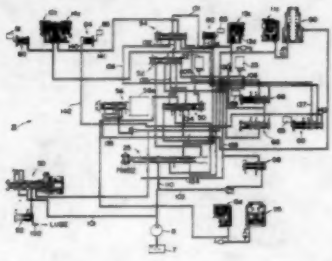
1. An apparatus for controlling hydraulic clutch operation in an automatic transmission comprising:

a hydraulic clutch operatively engaged by use of operational hydraulic pressure;

a hydraulic pressure control valve for regulating the operational hydraulic pressure supplied to said hydraulic clutch in accordance with a control force;

detection means for detecting a condition immediately before engagement in said hydraulic clutch based on a change in said operational hydraulic pressure; and

control means for adjusting a timing to change said control force in said hydraulic pressure control valve in response



to a detection of said condition immediately before engagement by said detection means.

4,942,788

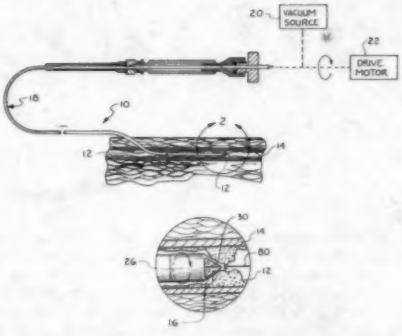
METHOD OF MANUFACTURING A CUTTER FOR ATHERECTOMY DEVICE

Andrew F. Farr, Spring Valley, and Herbert R. Radisch, Jr., San Diego, both of Calif., assignors to InterVentional Technologies, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 213,691, Jun. 30, 1988, Pat. No. 4,887,613, which is a continuation-in-part of Ser. No. 123,713, Nov. 23, 1987, Pat. No. 4,895,166. This application Jul. 26, 1989, Ser. No. 386,905

Int. Cl.[5] A61B *10/00*

U.S. Cl. 76—115 **14 Claims**



1. A method for manufacturing an atherectomy cutter which comprises the steps of:

boring into a cylindrical-shaped rod substantially along its longitudinal axis to form an interior which successively and connectingly includes a cylindrical hollow of relatively large diameter, a narrowingly tapered conical intermediate hollow and a cylindrical hollow of relatively small diameter;

turning the rod to configure an outer surface with the interior to establish a blank of uniform thickness; and

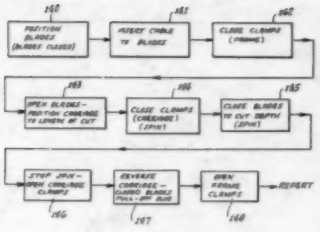
burning a hole into the intermediate hollow of the blank to form a blade for the cutter.

4,942,789

APPARATUS FOR STEP STRIPPING WIRE MEANS

Jack L. Hoffa, Brea, and Greg Nazerian, Pasadena, both of Calif., assignors to Eubanks Engineering Co., Monrovia, Calif.

Continuation-in-part of Ser. No. 220,480, Jul. 18, 1988, Pat. No. 4,869,135. This application Apr. 10, 1989, Ser. No. 335,386
The portion of the term of this patent subsequent to Sep. 26, 2006, has been disclaimed.
Int. Cl.[5] H02G 1/12
U.S. Cl. 81—9.51 33 Claims



1. In apparatus for stripping sheathing from wire at controllable depth, the combination comprising:

(a) a frame,

(b) wire clamp means on the frame for sidewardly clamping the wire sheathing, at a location spaced from the end of the wire advanced past the clamp means,

(c) a carriage on the frame linearly movable longitudinally toward and away from the wire clamp means,

(d) a rotating spindle on the carriage and blade means on the spindle and rotatable thereby to rotatably cut into the wire sheathing,

(e) wire engaging guide means mounted to the carriage, independently of the spindle, for sidewardly engaging the wire sheathing at a location between the clamp means and said blade means,

(f) means to control the depth of cutting of the blade means into the sheathing, and as the spindle rotates,

(g) first drive means operatively connected with the carriage to carry the blade means to selected positions along the wire and at which the blade means then cuts into the sheathing, to controlled depth, the carriage being retractable to pull a cut plug of the sheathing endwise off the wire,

(h) second drive means on the carriage and operatively connected with the spindle to rotate same, the spindle being rotatably mounted on the carriage,

(i) said wire engaging guide means including two guide parts, and including third drive means operatively connected with those parts to move them relatively toward and away from one another,

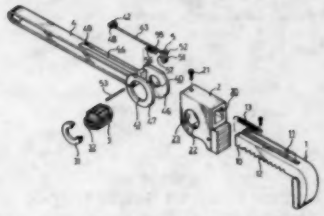
(j) and a microprocessor operatively connected with said first, second and third drive means for controlling operation thereof.

4,942,790

PIPE WRENCH

Bor J. Wang, 3 Fl., No. 740, Chung Cheng Rd., Yung Ho City, Taipei Hsien, Taiwan

Filed Sep. 26, 1989, Ser. No. 412,485
Int. Cl.[5] B25B 13/12
U.S. Cl. 81—133 3 Claims



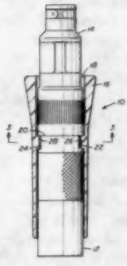
1. A pipe wrench comprising a handle, a pair of end plates each with a hole being provided at a front end of said handle, a cavity being formed in said front end for receiving a spring and a ball, and a groove with three position recesses being formed on an upper surface of said handle for receiving a button and a rod; a pawl with two teeth being pivotally fixed in front of said ball; a seat with a transverse hole and a longitudinal hole being pivotally fixed between said end plates of said handle by a ratchet wheel, said ratchet wheel extending through said holes of said end plates and said transverse hole of said seat; and a head with a rack formed on a lower surface thereof being slidably provided in said longitudinal hole of said seat, said rack of said head engaging with said ratchet wheel so that said head can be extended or retracted by a rotation of said ratchet wheel.

4,942,791

ERGONOMIC HANDLE FOR HAND-HELD TOOLS

John F. Stewart, and Russell D. Richardson, both of Lexington, S.C., assignors to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 393,835, Aug. 14, 1989, which is a division of Ser. No. 258,236, Oct. 14, 1988, abandoned. This application Sep. 13, 1989, Ser. No. 406,696
Int. Cl.[5] B25B 13/00
U.S. Cl. 81—177.1 5 Claims



1. In a rotational air tool having a substantially cylindrical motor housing and clutch housing which are joined with a threaded joint, as well as a sleeve with a substantially cylindrical bore designed to accommodate the housings, wherein the improvement comprises:

said sleeve being locked to said housings by a pair of radially inwardly extending male tabs on the inner bore of the sleeve which lockingly mate with a pair of oppositely extending female tabs on the outer surface of said hous-

ings, to prevent rotational and axial movement of the sleeve relative to the housings;

the outer surface of said sleeve having a trilobular cross-section, and being of substantially the same diameter over the majority of its axial length; and

at least one end portion of said outer surface of said sleeve being flared radially outwardly along the axial length of the handle and wherein the flared end portion has a trilobular cross-sectional shape.

4,942,792

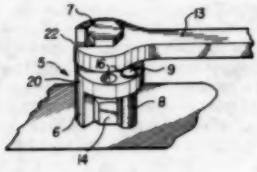
STRIP LUG AND NUT REMOVER

Nelson E. Thornton, 1653 Thetford Rd., Towson, Md. 21204

Continuation of Ser. No. 163,032, Mar. 2, 1988, abandoned, and a continuation of Ser. No. 317,669, Mar. 1, 1989. This application Mar. 1, 1989, Ser. No. 317,669

Int. Cl.[5] B25B *13/50*

U.S. Cl. 81—53.2 **4 Claims**



1. A strip lug and nut remover for removing a stripped nut, comprising a substantially semi-circular hollow housing with a semi-circular bore therein and having a circular shaped closed top and a shoulder of semi-circular shape formed integrally with said closed top and arranged and extending perpendicularly thereto to form said semi-circular bore, said housing having an inner surface, at least two spaced sets of spaced teeth formed in said inner surface of said shoulder of said hollow housing and extending longitudinally of said hollow housing, a series of arcuate grooves formed in the inner surface of said shoulder, each groove being the same length as each set of spaced teeth, said sets of teeth and said arcuate grooves being alternately disposed along said inner surface of said such that one of said arcuate grooves is positioned between saic sets of spaced teeth housing with the edges and corner of a stripped nut being positioned against the sets of teeth and grooves, a lug means extending upwardly from said closed top and formed integrally therewith, said top of said hollow housing having at least one aperture extending therethrough, and an eccentrically mounted pin means coupled in one of said at least one aperture in said top of said hollow housing and extending longitudinally downwardly from said top therefrom to engage a stripped nut to be removed, wherein when the semi-circular hollow housing of said strip lug and nut remover is placed over a stripped nut, with the head of a lug wrench being placed over said lug means, with said strip lug and nut remover being and positioned so its shoulder is located against one of the faces of said stripped nut and one of its edges and with said eccentrically mounted pin means is arranged to engage an opposite side of said stripped nut so that when said lug wrench is rotated in the proper direction, said eccentrically mounted pin is positioned in engagement with said stripped nut, and said stripped nut is broken against its adjacent structure so that it can be removed from its mating structure.

4,942,793

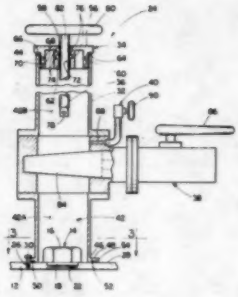
APPARATUS AND METHOD FOR REMOVING AND REPLACING A FEEDTHROUGH CONNECTOR IN A PRESSURIZED SPACECRAFT HULL

Herbert E. Ferree, Hempfield Twp., Westmoreland County, and Ellen J. Revelj, Monroeville, both of Pa., assignors to Space Industries Partnership, L.P., Webster, Tex.

Filed May 16, 1988, Ser. No. 194,620

Int. Cl.[5] B25B *13/02*

U.S. Cl. 81—54 **15 Claims**



1. An apparatus for removing a connector mounted in an access opening in a wall of a pressurized vessel, said apparatus comprising:

(a) an elongated hollow sleeve defining a chamber and having upper and lower opposite open ends;

(b) sleeve attaching means defined on said lower sleeve open end for sealably attaching said sleeve to the vessel wall about the access opening thereof and the connector mounted therein;

(c) a cap sealably mounted to said upper sleeve open end so as to close the same, said cap being removable for opening said upper sleeve open end;

(d) an elongated member mounted to and extending through said cap and being vertically reciprocally movable relative to said cap and through said sleeve chamber between upper and lower ends of said sleeve, said elongated member being operable for engaging the connector, removing the same from the access opening in the wall and lifting the connector from said lower to upper end of said sleeve, said elongated member and connector engaged therewith being removable from said sleeve upon removal of said cap therefrom;

(e) first valve means mounted to said sleeve between and spaced from said upper and lower ends thereof and being actuatable between a first displaced condition wherein said sleeve chamber is closed between said upper and lower sleeve open ends dividing said chamber into upper and lower portions being sealed from one another and preventing vertical movement of said elongated member from said upper to lower end of said sleeve and a second condition wherein said sleeve chamber is opened between said upper and lower sleeve open ends communicating said upper and lower chamber portions with one another and permitting vertical movement of said elongated member between said upper and lower ends of said sleeve; and

(f) second valve means connected in communication with said sleeve above said first valve means and being operable to vent atmosphere external of said sleeve with said upper chamber portion of said sleeve.

4,942,794

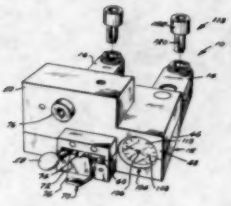
TORQUE TOOL

Robert F. Snyder, Hamden, and John H. Ferguson, Rockyhill, both of Conn., assignors to Raymond Engineering Inc., Middletown, Conn.

Continuation of Ser. No. 244,928, Sep. 15, 1988, abandoned. This application Apr. 27, 1989, Ser. No. 346,362

Int. Cl.[5] B25B *17/00*

U.S. Cl. 81—57.22 **25 Claims**



1. A torque wrench comprising:

a housing having an interior and an exterior;

a first arm pivotably mounted in said housing and extending outwardly of said housing;

a second arm pivotably mounted in said housing and extending outwardly of said housing, said first arm being spaced from said second arm;

first gear train means in said first arm and terminating at a first output gear;

second gear train means in said second arm and terminating at a second output gear;

gear selector means at least partially in said housing, said gear selector means actuating either said first gear train means or said second gear train means; and

third gear train means in said housing for torque multiplication, said third gear train means having an input means thereto, said input means communicating between said third gear train means and the exterior of said housing, said third gear train means including a rotatable drive shaft communicating and adapted to drive said gear selector means.

4,942,795

PRECISION CUTTER WITH AUTOMATED PRESSURE CONTROL

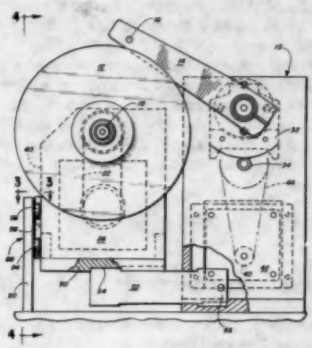
Thomas A. Linke, Wadsworth, Ill.; Alan W. Wilkerson, Cedarburg, Wis., and Ashok K. Parida, Frankfort, Ill., assignors to Buehler Ltd., Lake Bluff, Ill.

Filed Jun. 2, 1988, Ser. No. 201,531

Int. Cl.[5] B23Q *15/013*

U.S. Cl. 83—72 **15 Claims**

1. In an automatic saw of the type having a rotatable saw blade for cutting through a workpiece which is carried on a movable arm which permits the workpiece to be moved into engagement with the saw blade for cutting through the workpiece, the improvement comprising, in combination, a rotatable saw blade mounted on a first shaft, a saw blade drive motor for rotating said first shaft, first frame means supporting said saw blade motor and said first shaft and said saw blade, load cell means providing an electical output signal corresponding to a load supported thereon, said first frame means being mounted on said load cell means to measure the force exerted against said saw blade by said workpiece, arm means for carrying said workpiece, and arm drive means for moving



said arm means toward said saw blade, said arm drive means being controlled in response to said electrical output signal.

4,942,796

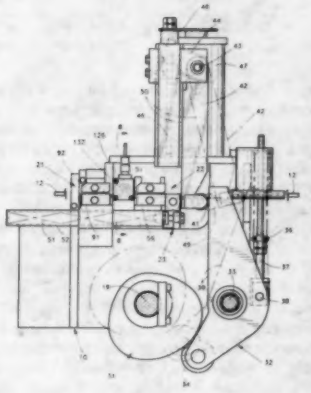
STOCK FEED APPARATUS FOR FORGING MACHINES AND THE LIKE

Harry A. Dom, and John A. Maistros, both of Tiffin, Ohio, assignors to The National Machinery Company, Tiffin, Ohio

Filed Aug. 3, 1988, Ser. No. 228,004

Int. Cl.[5] B26D *5/24, 7/06*

U.S. Cl. 83—72 **18 Claims**



1. A cyclically operable stock feed apparatus for forging machines and the like which intermittely feeds predetermined lengths of elongated stock to a cutter for shearing workpieces having said predetermined length from said stock, comprising a frame, a fixed gripper on said frame, a movable gripper on said frame movable with straight-line movement through a stroke one end of which provides a gripping position and the other end of which provides a release position, and cam drive means operating to cycle said movable gripper between said positions and to open and close said grippers in timed relationship, said cam drive means including:

(a) a firs cam drive moving said movable gripper through said stroke back and forth between said gripping and release positions;

(b) a second cam drive for controlling said movable gripper

so that it is released while said movable gripper moves from said release position to said gripping position;

(c) a third cam drive for controlling said fixed gripper so that it is released while said movable gripper is moving from said gripping position to said release position for feeding stock;

(d) said cam drives operating in timed relationship and being timed so that at least one of said grippers is closed to grip said stock during the entire time of each cycle to maintain complete control of the positions of said stock; and

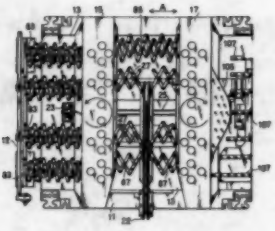
(e) measuring means operating to independently measure the length of stock fed during each cycle of said stock feed apparatus.

4,942,797

PROGRAMMABLE CONTROLLED TURNBLANKING MACHINE

Susumu Nakamura, Tokyo, Japan, assignor to Sankyo Oilless Industry, Inc., Tokyo, Japan

Filed Nov. 7, 1988, Ser. No. 267,850
Int. Cl.[5] B26D 7/00
U.S. Cl. 83—76.9 **3 Claims**



1. A programmable controlled turnblanking machine having first and second blanking dies each provided with a cutting edge and disposed at predetermined positions in a strip feed direction on a bed in order to cut out blanks of predetermined shape and size from a strip in cooperation with each cutting edge of the blanking dies, said programmable controlled turnblanking machine comprising:

a blanking apparatus having a first blanking die disposed in front in said strip feed direction and being prevented from sliding in the strip feed direction and being rotatably supported at a center thereof on said bed, and a second blanking die being disposed behind the first blanking die in said strip feed direction and so as to be slidable on the bed in the strip feed direction, the second blanking die being rotatably supported at a center thereof on said bed, said blanking apparatus including a pusher for pushing out blanks after cutting from between the first and second dies, and means connected to said pusher so that said pusher is always positioned at a center position between the first blanking die and the second blanking die when the second blanking die is moved on said bed;

a teaching unit for inputting a rotational angle θ_1 of said first blanking die, and a slide distance X of said second blanking die as well as rotational angle θ_2 thereof and setting positioning data for the blanking dies as program data; and

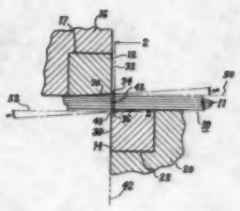
a control box for automatically calling predetermined positions of said first and second blanking dies by inputting a program number of a program based on said program data which have been set by said teaching unit and automatically controlling a slide position and each rotational angle of the first and second blanking dies of said blanking apparatus.

4,942,798

APPARATUS FOR SHEAR-CUTTING A STACK OF AMORPHOUS STEEL SHEETS

Alan I. Taub; Minyoung Lee, and Louis E. Hibbs, Jr., all of Schenectady, N.Y., assignors to General Electric Company, King of Prussia, Pa.

Filed Apr. 6, 1989, Ser. No. 334,248
Int. Cl.[5] B26D 1/08
U.S. Cl. 83—636 **8 Claims**



1. Apparatus for shear-cutting a stack of thin amorphous steel sheets along a cutting plane that extends transversely of said stack, comprising:

(a) first and second blades each having a first surface for engaging said stack at one side thereof and a second surface that extends transversely of said first surface and generally parallel to said cutting plane, the first and second surfaces of each blade intersecting at a corner,

(b) means for positioning said blades at the start of a cutting operation so that said corners are positioned at opposite sides of said stack and also on opposite sides of said cutting plane in juxtaposition thereto, and

(c) means for moving one of said blades during a cutting operation so that the corner thereof moves toward the corner of the other blade in a direction parallel to said cutting plane, thereby causing the corners of said blades to shear-cut the stack along said cutting plane, and further characterized by:

(d) said first surface of said one blade being disposed at predetermined rake angle with respect to a reference plane extending through a point on the corner of said one blade and normal to said cutting plane and to the direction of motion of said one blade,

(e) said first surface of said other blade being disposed at predetermined rake angle with respect to a reference plane extending through a point on the corner of said other blade and normal to said cutting plane and to the direction of motion of said one blade, and

(f) the sum of said rake angles being a negative value of between 5 degrees and 35 degrees, and in which: the rake angle of either of said blades is considered to be negative if said first surface of the blade, in intersecting said second surface thereof at said corner of the blade, is so inclined as to make the corner less sharp than it would be if said first surface were located in said reference plane.

4,942,799

METHOD OF GENERATING A TONE SIGNAL

Hideo Suzuki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Oct. 22, 1987, Ser. No. 112,386
Claims priority, application Japan, Oct. 24, 1986, 61-251936
Int. Cl.[5] G10H 7/00, 1/06
U.S. Cl. 84—603 **14 Claims**

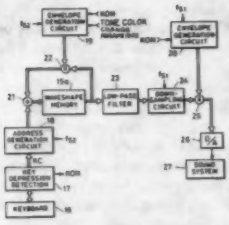
1. A method of generating a tone signal comprising:

a first step of obtaining waveshape data which has been sampled with a predetermined sampling frequency which is the higher of a first sampling frequency and a second sampling frequency;

a second step of performing a predetermined tone synthesis

modulation operation to generate spectrum components by using said waveshape data as waveshape data corresponding to at least one of a signal to be modulated and a modulating signal;

a third step of limiting the frequency band of the output signal of said modulation operating to a frequency band



below a frequency which is ½ of the lower of said first and second sampling frequencies; and

a fourth step of resampling the output signal which has been limited in frequency band in said third step with the lower of said first and second sampling frequencies and providing the resampled signal as a tone signal;

4,942,800

PROCESS FOR THE MANUFACTURE OF EXPLOSIVE CARTRIDGES, AND EXPLOSIVE CARTRIDGES OBTAINED USING THE SAID PROCESS

Edmond Bouillet, Wemmel; Jean-Claude Celery, Brussels; Claude Declerck, Brussels, and Pierre Ledoux, Brussels, all of Belgium, assignors to Interox (Société Anonyme), Brussels, Belgium

PCT No. PCT/BE87/00008, § 371 Date Nov. 29, 1988, § 102(e) Date Nov. 29, 1988, PCT Pub. No. WO87/07258, PCT Pub. Date Dec. 3, 1987

PCT Filed May 21, 1987, Ser. No. 295,220

Claims priority, application France, May 30, 1986, 86 07931

Int. Cl.[5] C06D *1/08*; F42B *3/00*; C06B *21/00, 43/00*

U.S. Cl. 86—20.1 **13 Claims**

1. Process for the manufacture of explosive cartridges containing, in a tubular casing, an explosive composition comprising hydrogen peroxide, at least one oxidizable organic material and at least one gelling agent belonging to the class of macromolecular plastic materials, comprising the steps of:

mixing (a) a solution containing hydrogen peroxide of at least about 60 weight %, (b) oxidizable organic material and (c) at least one precursor monomer of the gelling agent; and

reacting said at least one precursor monomer to form macromolecules of the gelling agent in situ in the tubular casing.

4,942,801

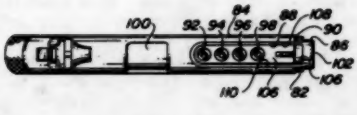
FIREARM GUN RISE AND MUZZLE JUMP REDUCER

Wil Schuemann, 705 Wagner Dr., Carson City, Nev.

Filed Mar. 10, 1989, Ser. No. 321,898

Int. Cl.[5] F41F *17/12*

U.S. Cl. 89—14.3 **37 Claims**



1. Apparatus for reducing a gun rise and muzzle jump of a semi automatic pistol having a chamber, a barrel having a bore formed therein and extending from the chamber and a muzzle defining an outlet end of the bore, a slide translatable along the barrel from a battery position to a recoil position and return during each discharge cycle of the pistol, said apparatus comprising in combination:

(a) at least one upwardly directed nozzle disposed in the barrel for exhausting propellant gas therethrough from the bore of the barrel upon discharge of the pistol to develope a downwardly directed thrust force on the pistol to counter the gun rise and the muzzle jump of the pistol upon discharge, said nozzle being disposed in the barrel at a location closer to the chamber than to the muzzle;

(b) a plurality of further nozzles disposed in the barrel for exhausting propellant gas therethrough from the bore of the barrel upon discharge of the pistol to develope a downwardly directed thrust force on the pistol to counter the gun rise and muzzle jump of the pistol upon discharge, said plurality of nozzles being disposed in the barrel at locations toward the muzzle from said at least one nozzle;

(c) an opening disposed in said slide for maintaining said at least one nozzle and said plurality of further nozzles exposed during translation of said slide from the battery position to the recoil position and return; and

(d) a barrel bushing disposed intermediate said slide and the barrel for supporting said slide upon the barrel, said barrel bushing being configured to maintain said at least one nozzle and said plurality of further nozzles exposed during translation of said slide.

4,942,802

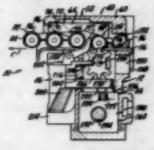
CONVERTIBLE, BELT/CLIP-FED AUTOMATIC GUN WITH POSITIVE SHELL CASING EJECTION

Eugene M. Stoner, Palm City, Fla., assignor to ARES, Inc., Port Clinton, Ohio

Filed Sep. 24, 1987, Ser. No. 100,388

Int. Cl.[5] F41D *10/14*

U.S. Cl. 89—191.01 **22 Claims**



1. A convertible, belt/clip-fed automatic gun, which comprises:

a. a gun barrel having a breech;

b. a receiver connected to the barrel and having a battery position disposed adjacent said barrel breech, a shell pick up position and a shell casing ejection port;

c. a bolt assembly slidably mounted in the receiver for reciprocating movement, in response to firing of the gun, between the battery position and a recoil position rearwardly of the shell pick up position and the shell casing ejection port, the bolt assembly having means for picking up a shell from the pick up position upon forward bolt assembly movement and for loading the picked up shell into the barrel breech and, after firing, for extracting a fired shell casing from the barrel breech upon rearward recoil movement from the battery position to the recoil position, said bolt assembly having an ammunition belt advancing and shell casing ejection cam track formed thereon;

d. ammunition belt receiving and advancing means, comprising a cam follower pivotally mounted to the receiver, at least one belt advancing pawl mounted to the cam follower, a belt feeding adapter for receiving an ammunition belt and means for releasably attaching said belt feeding adapter to the receiver at a position adjacent to said shell pick up position and in a cooperative relationship with said cam follower;

said cam follower having a cam track following portion thereof in engagement with said bolt assembly cam track and being thereby responsive to rearward movement of the bolt assembly from the breech to the recoil position for causing said belt advancing pawl to inwardly advance an ammunition belt held by the belt feeding adapter in a manner moving a shell in the belt into the shell pick up position and being responsive to forward movement of the bolt assembly from the recoil position to the battery position for moving said belt advancing pawl a shell distance outwardly in readiness for advancing the belt the next time the bolt assembly is moved rearwardly to the recoil position; and

e. an ammunition clip holder and means for releasably attaching the clip holder to the receiver in place of the belt feeding adapter and belt advancing pawl.

4,942,803

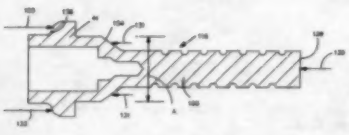
STEERING GEAR WITH PRESSURE-BALANCED VALVE

William T. Rabe, Lafayette, Ind., and Wendell L. Gilbert, Lebanon, Tenn., assignors to TRW Inc., Lyndhurst, Ohio

Division of Ser. No. 73,711, Jul. 15, 1987, Pat. No. 4,872,393. This application Feb. 27, 1989, Ser. No. 316,472

Int. Cl.[5] B62D *5/083*

U.S. Cl. 91—370 **4 Claims**



1. An apparatus comprising:

a fluid motor including a housing defining a chamber and a movable piston located in said chamber and dividing said chamber into first and second portions, said housing being adapted to be connected in fluid communication with a source of high pressure fluid and a reservoir which receives fluid at a relatively low pressure from said fluid motor upon movement of said piston in said chamber,

a one-piece rotatable combined valve part and followup member connected with said piston, said one-piece valve part and follow-up member including an externally threaded portion connected with said piston and a hollow valve portion which is closed at one end, said hollow valve portion including a first surface area which is continuously exposed to the low fluid pressure conducted to reservoir, said first surface area being partially disposed on an end of said one-piece valve part and follow-up member and being partially disposed within said hollow valve portion, said hollow valve portion of said one-piece valve part and follow-up member including a radially outwardly projecting annular flange disposed between opposite end portions of said hollow valve portion, said annular flange having a second surface area which is of the same size as said first surface area and which is continuously exposed to the relatively high fluid pressure conducted from the source of high pressure fluid, said hollow valve portion of said one-piece valve part and follow-up member including a third surface area which is of the same size as said first surface area and is disposed on a side of said flange opposite from said second surface area, said third surface area being exposed to the fluid pressure in said first chamber portion of said fluid motor, said one-piece valve part and follow-up member including a fourth surface area which is partially disposed on said hollow valve portion and is partially disposed on said externally threaded portion of said one-piece valve part and follow-up member, said fourth surface area being of the same size as said first surface area, said fourth surface area being exposed to the fluid pressure in said second chamber portion of said fluid motor,

a rotatable valve core disposed in said hollow valve portion of said one-piece valve port and follow-up member at a location radially inwardly of said flange, said valve core being rotatable relative to said hollow valve portion between an initial condition and first and second actuated conditions,

a torsion bar extending axially along said one-piece valve part and follow-up member and having a first end portion connected to said one-piece valve part and follow-up member adjacent to the closed end of said hollow valve portion and having a second end portion connected to said rotatable valve core, said torsion bar having a central portion which is at least partially disposed radially inwardly of said flange, said torsion bar being resiliently deflected by movement of said valve core from the initial condition toward either of said actuated conditions,

said valve core cooperating with said hollow valve portion to communicate relatively high fluid pressure from the source of fluid pressure to said second chamber portion of said fluid motor and said fourth surface area and to communicate the relatively low fluid pressure at the reservoir to said first chamber portion of said fluid motor and said third surface area when said valve core is in the first actuated condition, said one-piece valve part and follow-up member being pressure balanced when said valve core is in the first actuated condition by the relatively high fluid pressure on said second surface area being offset by the relatively high fluid pressure on said fourth surface area and by the relatively low fluid pressure on said first surface area being offset by the relatively low fluid pressure on said third surface area, said valve core cooperating with said hollow valve portion to communicate relatively high fluid pressure from the source of fluid pressure to said first chamber portion of said fluid motor and said third surface area and to communicate the relatively low fluid pressure at the reservoir to said second chamber portion of said fluid motor and said fourth surface area when said valve core is in the second actuated condition, said one-piece valve part and follow-up member being pressure balanced when said valve core is in the second actuated condition by the relatively high fluid pressure on said second surface area being offset by the relatively high fluid pressure on said third surface area and by the relatively low fluid pressure on said first surface area being offset by the relatively low fluid pressure on said fourth surface area.

4,942,804

PISTON WITH CERAMIC INSERT THAT COVERS PISTON HEAD PORTION DEFINING CAVITY

Tooru Matsuura, and Yoshinori Narita, both of Nagoya City, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya City, Japan

Filed Aug. 9, 1988, Ser. No. 230,048

Claims priority, application Japan, Aug. 11, 1987, 62-122124[U]; Nov. 20, 1987, 62-176435[U]

Int. Cl.[5] F16J *1/04*

U.S. Cl. 92—212 **13 Claims**

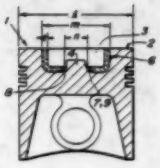
1. A piston comprising:

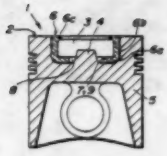
a cast piston body having a piston head which is partly recessed to form a cavity and has a central projection projecting into said cavity;

a ring-shaped ceramic insert cast in said piston body in such a way as to cover a piston head portion defining said cavity except said central projection-and-its adjacent piston head portion; and

wherein said piston head includes a top surface portion, a bottom surface portion and a circumferential surface portion between said top surface portion and said bottom

surface portion, said bottom surface portion having said central projection, said ceramic insert being so shaped as





to cover circumferential surface portion of said piston head only.

4,942,805

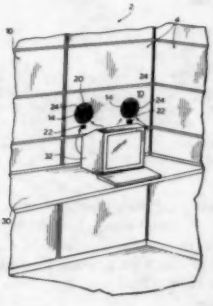
VENTILATED PANEL

John Hellwig, Toronto, and Philip Bradbury, North York, both of Canada, assignors to Teknion Furniture Systems Inc., Downsview, Canada

Filed Feb. 2, 1989, Ser. No. 305,097

Int. Cl.[5] F24F *7/007*

U.S. Cl. 98—1 **15 Claims**



10. In combination, an office panelling system having removable panel covers supported by metal frames generally interior to said panel covers, at least one of said covers having mounted thereon about a port in said panel an electric fan, said fan being oriented for causing a flow of air to pass through said removable panel cover when said fan is operated, and exhaust means for allowing air to leave the panelling system and wherein said electric fan is connected to an electrical supply interior to said office panelling system.

4,942,806

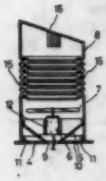
VEHICULAR INTERNAL AIR EXHAUSTING DEVICE

Feng-Lin Hwang, Kaohsiung City, Taiwan, assignor to Tech Zeal Industrial C., Ltd., Taiwan, Taiwan

Filed Jul. 24, 1989, Ser. No. 383,480

Int. Cl.[5] B60H *1/26*

U.S. Cl. 98—2.02 **3 Claims**



1. A vehicular internal air exhausting device which comprises:

a power source supply assembly for supplying electricity power from a battery under control of a set of switches;

an air exhausting assembly mounted on a trunk compartment top plate behind a vehicle seat for extracting the vehicular internal heated air toward said trunk compartment, said exhaust assembly comprising: a bottom plate, a motor seat, a motor having an output shaft, an air-extracting blades, and a cylindrical housing shell having an inner diameter; said bottom plate having an outlet in its center for the extracted air which enters the trunk compartment, screw holes near said bottom plate periphery for mounting to the trunk compartment top plate, and said bottom plate having an annular flange inside of and adapted to said housing shell inner diameter for connecting said top plate to said housing shell; said housing shell, containing said motor seat which is cone-formed and has a motor barrel in its center to accommodate said motor and aerofoils provided to bridge connection between said motor barrel and an outer circle of said motor seat; said motor united with said air-extracting blades at its output shaft; said housing shell having air intake cascades in its periphery and top areas, said motor being electrically connected to said power source supply assembly;

wherein the vehicular internal temperature will become equal to the outside temperature.

4,942,807

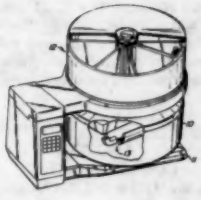
TURNING MECHANISM

Don M. Wong, 2296 Bunker Hill Dr., San Mateo, Calif. 94402

Continuation-in-part of Ser. No. 140,176, Dec. 31, 1987, Pat. No. 4,820,054. This application Feb. 14, 1989, Ser. No. 312,368

Int. Cl.[5] A47J *27/00*; B01F *7/14*

U.S. Cl. 99—348 **17 Claims**



1. An implement for use in cooking a food item such as a steak, fish filet or the like, said implement being used with a drive shaft rotating about a horizontal axis for automatically turning over said food item during cooking, comprising:

support means for supporting said food item during turning;

said cam follower having a cam track following portion thereof in engagement with said bolt assembly cam track and being thereby responsive to rearward movement of the bolt assembly from the breech to the recoil position for causing said belt advancing pawl to inwardly advance an ammunition belt held by the belt feeding adapter in a manner moving a shell in the belt into the shell pick up position and being responsive to forward movement of the bolt assembly from the recoil position to the battery position for moving said belt advancing pawl a shell distance outwardly in readiness for advancing the belt the next time the bolt assembly is moved rearwardly to the recoil position; and

e. an ammunition clip holder and means for releasably attaching the clip holder to the receiver in place of the belt feeding adapter and belt advancing pawl.

4,942,803

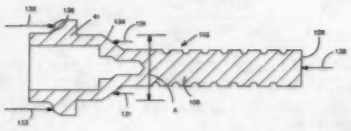
STEERING GEAR WITH PRESSURE-BALANCED VALVE

William T. Rabe, Lafayette, Ind., and Wendell L. Gilbert, Lebanon, Tenn., assignors to TRW Inc., Lyndhurst, Ohio

Division of Ser. No. 73,711, Jul. 15, 1987, Pat. No. 4,872,393. This application Feb. 27, 1989, Ser. No. 316,472

Int. Cl.[5] B62D *5/083*

U.S. Cl. 91—370 **4 Claims**



1. An apparatus comprising:

a fluid motor including a housing defining a chamber and a movable piston located in said chamber and dividing said chamber into first and second portions, said housing being adapted to be connected in fluid communication with a source of high pressure fluid and a reservoir which receives fluid at a relatively low pressure from said fluid motor upon movement of said piston in said chamber,

a one-piece rotatable combined valve part and followup member connected with said piston, said one-piece valve part and follow-up member including an externally threaded portion connected with said piston and a hollow valve portion which is closed at one end, said hollow valve portion including a first surface area which is continuously exposed to the low fluid pressure conducted to reservoir, said first surface area being partially disposed on an end of said one-piece valve part and follow-up member and being partially disposed within said hollow valve portion, said hollow valve portion of said one-piece valve part and follow-up member including a radially outwardly projecting annular flange disposed between opposite end portions of said hollow valve portion, said annular flange having a second surface area which is of the same size as said first surface area and which is continuously exposed to the relatively high fluid pressure conducted from the source of high pressure fluid, said hollow valve portion of said one-piece valve part and follow-up member including a third surface area which is of the same size as said first surface area and is disposed on a side of said flange opposite from said second surface area, said third surface area being exposed to the fluid pressure in said first chamber portion of said fluid motor, said one-piece valve part and follow-up member including a fourth surface area which is partially disposed on said hollow valve portion and is partially disposed on said externally threaded portion of said one-piece valve part and follow-up member, said fourth surface area being of the same size as said first surface area, said fourth surface area being exposed to the fluid pressure in said second chamber portion of said fluid motor,

a rotatable valve core disposed in said hollow valve portion of said one-piece valve port and follow-up member at a location radially inwardly of said flange, said valve core being rotatable relative to said hollow valve portion between an initial condition and first and second actuated conditions,

a torsion bar extending axially along said one-piece valve part and follow-up member and having a first end portion connected to said one-piece valve part and follow-up member adjacent to the closed end of said hollow valve portion and having a second end portion connected to said rotatable valve core, said torsion bar having a central portion which is at least partially disposed radially inwardly of said flange, said torsion bar being resiliently deflected by movement of said valve core from the initial condition toward either of said actuated conditions,

said valve core cooperating with said hollow valve portion to communicate relatively high fluid pressure from the source of fluid pressure to said second chamber portion of said fluid motor and said fourth surface area and to communicate the relatively low fluid pressure at the reservoir to said first chamber portion of said fluid motor and said third surface area when said valve core is in the first actuated condition, said one-piece valve part and follow-up member being pressure balanced when said valve core is in the first actuated condition by the relatively high fluid pressure on said second surface area being offset by the relatively high fluid pressure on said fourth surface area and by the relatively low fluid pressure on said first surface area being offset by the relatively low fluid pressure on said third surface area, said valve core cooperating with said hollow valve portion to communicate relatively high fluid pressure from the source of fluid pressure to said first chamber portion of said fluid motor and said third surface area and to communicate the relatively low fluid pressure at the reservoir to said second chamber portion of said fluid motor and said fourth surface area when said valve core is in the second actuated condition, said one-piece valve part and follow-up member being pressure balanced when said valve core is in the second actuated condition by the relatively high fluid pressure on said second surface area being offset by the relatively high fluid pressure on said third surface area and by the relatively low fluid pressure on said first surface area being offset by the relatively low fluid pressure on said fourth surface area.

4,942,804

PISTON WITH CERAMIC INSERT THAT COVERS PISTON HEAD PORTION DEFINING CAVITY

Tooru Matsuura, and Yoshinori Narita, both of Nagoya City, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya City, Japan

Filed Aug. 9, 1988, Ser. No. 230,048

Claims priority, application Japan, Aug. 11, 1987, 62-122124[U]; Nov. 20, 1987, 62-176435[U]

Int. Cl.[5] F16J *1/04*

U.S. Cl. 92—212 **13 Claims**

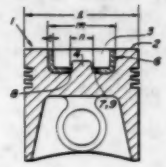
1. A piston comprising:

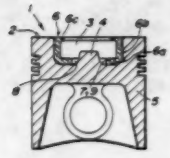
a cast piston body having a piston head which is partly recessed to form a cavity and has a central projection projecting into said cavity;

a ring-shaped ceramic insert cast in said piston body in such a way as to cover a piston head portion defining said cavity except said central projection-and-its adjacent piston head portion; and

wherein said piston head includes a top surface portion, a bottom surface portion and a circumferential surface portion between said top surface portion and said bottom

surface portion, said bottom surface portion having said central projection, said ceramic insert being so shaped as





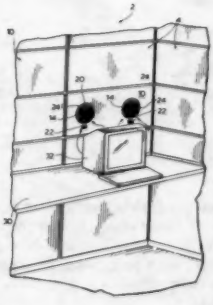
to cover circumferential surface portion of said piston head only.

4,942,805

VENTILATED PANEL

John Hellwig, Toronto, and Philip Bradbury, North York, both of Canada, assignors to Teknion Furniture Systems Inc., Downsview, Canada

Filed Feb. 2, 1989, Ser. No. 305,097
Int. Cl.[5] F24F 7/007
U.S. Cl. 98—1 15 Claims



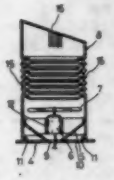
10. In combination, an office panelling system having removable panel covers supported by metal frames generally interior to said panel covers, at least one of said covers having mounted thereon about a port in said panel an electric fan, said fan being oriented for causing a flow of air to pass through said removable panel cover when said fan is operated, and exhaust means for allowing air to leave the panelling system and wherein said electric fan is connected to an electrical supply interior to said office panelling system.

4,942,806

VEHICULAR INTERNAL AIR EXHAUSTING DEVICE

Feng-Lin Hwang, Keelung City, Taiwan, assignor to Tech Zeal Industrial C., Ltd., Taiwan, Taiwan

Filed Jul. 24, 1989, Ser. No. 383,480
Int. Cl.[5] B60H 1/26
U.S. Cl. 98—2.02 3 Claims



1. A vehicular internal air exhausting device which comprises:

a power source supply assembly for supplying electricity power from a battery under control of a set of switches;

an air exhausting assembly mounted on a trunk compartment top plate behind a vehicle seat for extracting the vehicular internal heated air toward said trunk compartment, said exhaust assembly comprising: a bottom plate, a motor seat, a motor having an output shaft, an air-extracting blades, and a cylindrical housing shell having an inner diameter; said bottom plate having an outlet in its center for the extracted air which enters the trunk compartment, screw holes near said bottom plate periphery for mounting to the trunk compartment top plate, and said bottom plate having an annular flange inside of and adapted to said housing shell inner diameter for connecting said top plate to said housing shell; said housing shell, containing said motor seat which is cone-formed and has a motor barrel in its center to accommodate said motor and aerofoils provided to bridge connection between said motor barrel and an outer circle of said motor seat; said motor united with said air-extracting blades at its output shaft; said housing shell having air intake cascades in its periphery and top areas, said motor being electrically connected to said power source supply assembly;

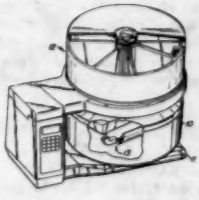
wherein the vehicular internal temperature will become equal to the outside temperature.

4,942,807

TURNING MECHANISM

Don M. Wong, 2296 Bunker Hill Dr., San Mateo, Calif. 94402

Continuation-in-part of Ser. No. 140,176, Dec. 31, 1987, Pat. No. 4,820,054. This application Feb. 14, 1989, Ser. No. 312,368
Int. Cl.[5] A47J 27/00; B01F 7/14
U.S. Cl. 99—348 17 Claims



1. An implement for use in cooking a food item such as a steak, fish filet or the like, said implement being used with a drive shaft rotating about a horizontal axis for automatically turning over said food item during cooking, comprising:

support means for supporting said food item during turning;

a turning member adapted for connection to said drive shaft so as to rotate about said horizontal axis, said turning member having a first portion extending perpendicular to said horizontal axis for connection to said support means for providing a moment arm for turning said food item and a second portion for providing leverage for lifting said food item during turning; and

linkage means for flexibly linking said support means to said turning member, said linkage means being connected to the first portion of said turning member at a position spaced apart from said horizontal axis and to said support means at a position proximate an end of said food item, whereby rotation of said turning member by said drive shaft rotates said food item over said horizontal axis.

4,942,808

FOOD PROCESSING APPARATUS

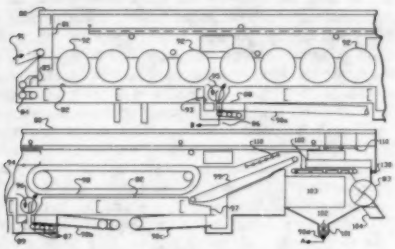
Clark K. Benson, Millbrae; Andrew A. Caridis, Foster City, and Lawrence F. Klein, Hillsborough, all of Calif., assignors to Heat and Control, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 147,808, Jan. 25, 1988, which is a division of Ser. No. 921,289, Oct. 20, 1986, Pat. No. 4,738,193, which is a continuation-in-part of Ser. No. 698,097, Feb. 4, 1985, abandoned. This application Nov. 10, 1988, Ser. No. 269,514

The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.

Int. Cl.[5] A47J *37/12*

U.S. Cl. 99—404 **3 Claims**



1. An apparatus for continuous cooking of food products comprising a container for containing a liquid cooking medium, conveying means for transporting food products along a predetermined path through said cooking medium, said path defined, in order by a plurality of cooking zones comprising a first zone commencing at a first inlet for introducing oil into said bath and ending at a second inlet along said path for introducing oil into said bath, a second zone commencing at said second inlet and ending at a first set of inlet and outlet means for withdrawing and introducing oil from and to said bath; and two or more contiguous successive zones, respectively beginning and ending with a set of inlet and outlet means for withdrawing and introducing oil into said bath, wherein each said inlet and outlet means is located within a sump dividing adjacent zones, and each of said sumps accommodates a filtering means for separating food products from oil entering said sump.

4,942,809

COOKING JACKET

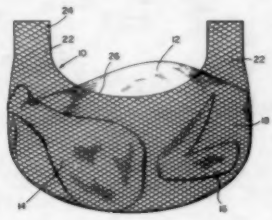
Elsie A. Simmons, Rte. 1, Box 253-B, Charlotte Hall, Md. 20622

Filed Jan. 26, 1989, Ser. No. 302,303

Int. Cl.[5] A47J *43/18*

U.S. Cl. 99—426 **3 Claims**

1. In combination, a cooking jacket and a meat product, said meat product producing drippings when being cooked and having dimensions and weight characteristics which render it difficult to handle and manipulate by conventional kitchen utensils when being cooked in a conventional manner, said cooking jacket comprising a one-piece mesh contained dimensioned to receive and closely fit the meat product, said container including two side panels, each of said side panels having a continuous upward extension adjacent each end thereof to form longitudinally spaced handle loops, said mesh container having a large opening in the area between the handle loops to enable said meat product to be inserted into and removed from the container and providing access to an upper portion of the meat product when being cooked, said mesh container being



continuous around a bottom portion and around both end portions thereof and being constructed of plastic mesh that is flexible, non-meltable at cooking temperatures of the meat product, said mesh container having a lengthwise dimension longer than a transverse dimension to form a sling when the container is supported by lifting the handle loops with the mesh enabling drippings produced when cooking the meat product to remain in a cooking pan when the container with the cooked meat product therein is lifted out of the cooking pan.

4,942,810

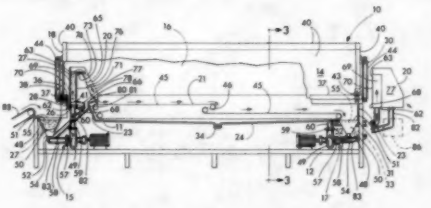
WATER SEAL BLANCHER

David R. Zittel, and Gregory M. Robbins, both of Columbus, Wis., assignors to Lyco Manufacturing, Inc., Columbus, Wis.

Filed Sep. 15, 1988, Ser. No. 245,203

Int. Cl.[5] A23L *3/00*; A23N *12/00*

U.S. Cl. 99—477 **23 Claims**



1. An improved water seal blancher, comprising:

(a) a substantially steam-tight chamber body having an interior, a conveyor apparatus within the chamber body interior for conveying a particulate food product while subjecting the food product to a continuous, controlled steam heat treatment;

(b) a hydro food pump including an intake having an upper opening exposed to the external atmosphere through which the food product may be received and a bottom opening, and having walls of sufficient height for entraining water within the intake to form an intake water seal between the upper opening and the bottom opening; and a liquid pump having an inlet connected in fluid communication to the intake bottom opening and an outlet conduit extending into the chamber body in fluid-tight relation;

(c) a riser tank within the chamber including a bottom defining a bottom hole connected to the pump outlet conduit in

fluid communication, and upwardly extending walls, one said wall having a substantially horizontal upper edge of substantial width so that water and entrained food product pumped through the pump outlet conduit into the riser tank will rise and spill over the horizontal upper edge along the width thereof and out of the riser tank;

(d) a separator screen about as wide as the riser tank horizontal upper edge positioned below the upper edge to receive spilled water and food product therefrom so that food product will be caught on the screen and entraining water will fall through the screen, the screen including a topside which is slanted downwardly away from the riser tank horizontal upper edge and toward the conveyor apparatus so that food product which is caught by the screen will move down and off the screen topside onto the conveyor apparatus; and

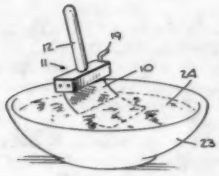
(e) a return conduit extending out of the container body in fluid-tight relation and to the intake below the effective level of the intake water seal to conduct separated entraining water from the chamber to the intake so that entraining water in the intake, pump and conduits will maintain an effective water seal between the interior of the chamber body and the external atmosphere.

4,942,811

FAT-REMOVING CULINARY IMPLEMENT

James O. Kuhn, 140 Nassau St., New York, N.Y. 10038

Filed Nov. 21, 1988, Ser. No. 273,594
Int. Cl.[5] A47L *13/20*; A47J *43/28*
U.S. Cl. 99—495 **5 Claims**



1. A culinary implement functioning as a mop to extract from an aqueous food mixture insoluble liquid fats dispersed therein, said implement comprising:

(A) a porous fabric pad having a predetermined thickness formed of compressible filtration material having both hydrophobic and lipophilic properties;

(B) a holder for the pad; and

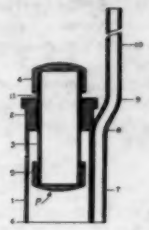
(C) a handle attached to the holder to form a mop, whereby when the implement is used to sweep the mixture, the fats disposed therein are attracted and adhere to the pad whereas the aqueous food mixture filters therethrough, thereby making it possible to free the food mixture of its fat content, said holder being provided with a pair of rollers having a space therebetween to define a nip for receiving the pad, said nip having a gap whose size is somewhat smaller than the thickness of the pad, said rollers being supported at fixed parallel positions for rotation on shafts between the opposing arms of a yoke, the shaft of one of said rollers being coupled to a hand crank, whereby when one end of the pad is received and compressed in the nip, the remaining portion thereof extends therefrom to form a flat mop which may be swept back and forth in the food mixture.

4,942,812

DEVICE FOR COMPRESSING EMPTY CANS

Joel R. Williams, 124 McKendrie St., San Jose, Calif. 95126-1408

Filed Mar. 23, 1989, Ser. No. 327,739
Int. Cl.[5] B30B *1/100, 15/06*
U.S. Cl. 100—214 **5 Claims**



1. A device for compressing a collapsible container, comprising:

(a) a cylindrical shell symmetrical about a central axis and open at one end and closed at its opposite end for substantially enclosing the container to be compressed, said cylindrical shell accepting the container through said open end to be compressed and ejecting the compressed container through said open end, and the opposite closed end forming a slide bearing;

(b) a tubular cylindrical piston having end caps on opposite ends, said piston slidably disposed in said slide bearing and including a portion extending within the shell for compressing a container disposed within said shell, said piston including an extension projecting out of the shell closed by one of said end caps and adapted to be depressed by foot pressure; and

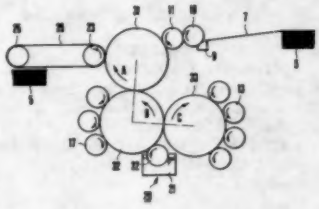
(c) a handle including a mounting portion attached to the exterior of said shell, said handle also including a grip portion parallel to the central axis of said shell and spaced grasped by an operator of said device to provide stability.

4,942,813

METHOD AND APPARATUS FOR DRY OFFSET INTAGLIO PRINTING

Shigeji Arai, Matsudo, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 883,023, Jul. 8, 1986, abandoned, which is a continuation of Ser. No. 728,051, Jun. 29, 1985, abandoned.
This application Jun. 4, 1987, Ser. No. 58,686
Claims priority, application Japan, Jul. 19, 1984, 59-148532
Int. Cl.[5] B41F *9/02, 11/02*
U.S. Cl. 101—152 **2 Claims**



1. A method of offset intaglio printing utilizing an intaglio cylinder, an impression cylinder and a blanket cylinder, the method comprising the steps of:

forming a dry offset image on said blanket cylinder;

forming an intaglio image on said intaglio cylinder;

transferring said dry offset image formed on said blanket cylinder onto a non-image portion of said intaglio cylinder by rotating the same in contact with said blanket cylinder while maintaining the axis of said intaglio cylinder in precise registration relative to the axis of said blanket cylinder so that non-registration of the dry offset image and the intaglio image, due to a potential displacement of the axis of the intaglio cylinder relative to the axis of the blanket cylinder in accordance with substantial pressure applied thereon by the impression cylinder, does not occur; and

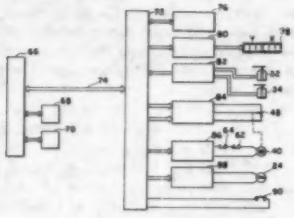
simultaneously transferring onto a sheet wrapped about said impression cylinder said intaglio image and said dry offset image on said intaglio cylinder, in accordance with said pressure.

4,942,814

OPERATION STAND FOR MEASURING SHEET SIZE FOR SHEET-FED PRESS

Osamu Sugiyama, Shizuoka, Japan, assignor to Shinohara Machinery Co., Ltd., Shizuoka, Japan

Filed Aug. 10, 1989, Ser. No. 391,876
Int. Cl.[5] B41F *13/24*
U.S. Cl. 101—232 **1 Claim**



1. An operation stand for a sheet-fed press, comprising stopper means set up at the end portions of a table surface of said operation stand and adapted to restrict the positions of the longitudinal and lateral edges of paper, a suction means adapted to apply vacuum to said paper through numerous suction holes provided in the table, so as to bring said paper into close contact with and fix the same to said table surface, a detecting means adapted to scan said paper with a detector with reference to guide shafts extending under said table surface in the longitudinal and lateral directions of said paper and detect the positions of said longitudinal and lateral edges of said paper, an arithmetic means for calculating the size of said paper on the basis of the information on the positions of the edges thereof from said detecting means, and a display means for digitally displaying the size of said paper calculated by said arithmetic means.

4,942,815

METER ROLL MOUNTING MEANS

Larry J. Greer, Chesterfield, and Robert A. Sexton, Manchester, both of Mo., assignors to Allied Gear and Machine Company, St. Louis, Mo.

Filed Nov. 7, 1988, Ser. No. 268,087
Int. Cl.[5] B41F *31/32*; B41L *27/34*
U.S. Cl. 101—352 **10 Claims**

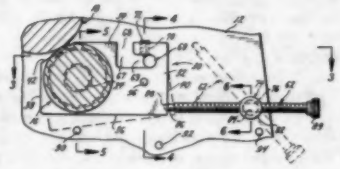
1. In a roll assembly in which a primary roll is mounted for engagement by a secondary roll having an axis of rotation parallel to the axis of rotation of the primary roll, a secondary roll mounting assembly comprising:

a secondary roll having opposed journal ends,

opposed side support means at each end of said secondary roll,

opposed mounting frames each including bearing means receiving an associated journal end,

pin means and cooperating slot means respectively pivotally mounting each mounting frame of said mounting frames to an associated support means of said side support means in spaced relation from said bearing means, one of said pin means and slot means being provided by the respective mounting frame and the other of said pin means and slot means being provided by the associated support means, said pin means being disengageable from said slot means to remove each said mounting frame from said associated support means, and



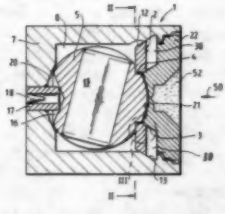
adjustment means including a threadedly adjustable screw between each said associated support means and each respective said mounting frame disposed in spaced relation from said pin means to apply pressure to said mounting frame and control pivoting of said mounting frame about said pin means to swing said secondary roll about said pin means toward and away from said primary roll, said opposed mounting frames and said journal ends being entirely disposed inwardly of said opposed side support means so as to facilitate removal of said mounting frames and said secondary roll as a unit from between the opposed side support means.

4,942,816

SAFE-AND-ARM DEVICE FOR THE FUZE OF A SPIN-STABILIZED PROJECTILE

Adolf Bankel, Uttenreuth; Hans Strauss, Reichenschwand, and Stephan Kerk, Schnaittach, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Sep. 15, 1989, Ser. No. 408,141
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1988, 3831862
Int. Cl.[5] F42C *15/26*
U.S. Cl. 102—235 **3 Claims**



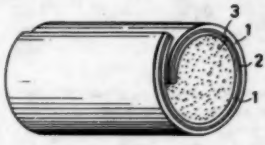
1. A safe-and-arm device for a fuze for a spin-stabilized projectile; comprising a supporting housing for said fuze; a spherical rotor being rotatably supported within the supporting housing, a radial groove formed in said supporting housing, said rotor having a bore; a detonator inserted in said bore; an annular groove in a peripheral region of said rotor extending in a plane axially offset relative to said radial groove, a spreadable restraining means inserted in said rotor groove for saving the rotor which is retained in a secured position only prior to firing of the projectile through the spreadable restraining means

which are axially displaced and spread apart only subsequent to firing of the projectile responsive to axial and spin forces, and said spreading facilitating pivoting of the rotor with the detonator into the armed position after release thereof, said restraining means being a restraining ring contacting an end surface of the annular groove in said rotor through a conical centering mandrel on the fuze housing in the secured position of said rotor, said restraining ring having an inner conical surface conforming with the centering mandrel and an outer conical surface contacting an inner conical surface on the housing, said restraining ring having a plurality of substantially wedge-shaped groove profiles spaced about the circumference thereof forming radially inwardly extending supporting tongues and supporting surfaces, and including an outer ring structure incorporating a plurality of permanently deformable connectors of similar cross-sections intermediate said tongues, said ring structure having a slot cut therethrough, and said restraining ring forming an annular gap facing the bottom of the annular groove.

4,942,817
EXPLOSIVE CARTRIDGE AND PAPER POLYETHYLENE LAMINATED ON BOTH THE SIDES USED THEREFOR

Yoshiyuki Ikeda, Ube, and Toshinori Ariki, Yamaguchi, both of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1989, Ser. No. 447,367
Claims priority, application Japan, Dec. 15, 1988, 63-161904
Int. Cl.[5] F42G *3/00*
U.S. Cl. 102—331 **9 Claims**

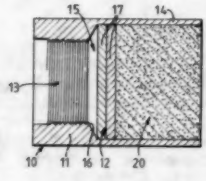


1. An explosive cartridge produced by packaging an explosive with a paper polyethylene-laminated on both the sides, the outer surface of the cartridge having an angle of slide of not more than 12 degrees.

4,942,818
TRAINING OR MARKING BULLETS

Michael E. Saxby, Leamington Spa, England, assignor to Comte De Lalaing (formerly Josse Ghislain Emmanuel De Lalaing), Zandbergen, Belgium

Filed Oct. 31, 1988, Ser. No. 264,691
Claims priority, application United Kingdom, Oct. 31, 1987, 8725589
Int. Cl.[5] F42B *8/12*
U.S. Cl. 102—444 **10 Claims**

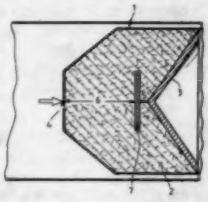


1. A bullet comprising:
(a) at least 60% by weight of metal particles having an average particle size less than 200 microns embedded in a soft matrix of a wax material softened by a blended-in plasticizing oil to impart softness to the bullet, and
(b) the bullet being at least partially coated with a blend of wax material with a lesser proportion of oil plasticizer than the matrix was material.

4,942,819
HOLLOW CHARGE

Klaus Thoma, Max-Emanuel-Street 12, 8898 Schrobenhausen; Klaus Lindstädt, Teutonen St. 54, 5300 Bonn 2, and Karl Rudolf, Georg-Hitl-St. 8, 8898 Schrobenhausen, all of Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 397,463
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3127280
Int. Cl.[5] F42B *1/024*
U.S. Cl. 102—476 **7 Claims**



1. Shaped explosive charge having a leading end facing in the firing direction and a trailing end, an inverted conically shaped jet-forming lining extending from the leading end toward the trailing end, an explosive charge extending from said jet-forming lining toward the trailing end, said lining being arranged when said explosive charge is ignited to produce a channel for a follow-through projectile for use against take-off runways, roadways or other stationary ground targets, wherein the improvement comprises an initiator point (4) located at the trailing end of said explosive charge, a projectile-forming inert material body (7, 8, 9, 10, 11, 12, 15, 16) is located in said explosive charge between and spaced form said initiator point and said jet-forming lining, and the size, geometry, and location of said body is adaptable to the characteristic of the target against which the shaped charge is directed so that the inert material body forms an explosive-formed projectile when said explosive charge is ignited for neutralizing crater base effects caused by the jet-forming lining and improving the effectiveness of the follow-through projectile.

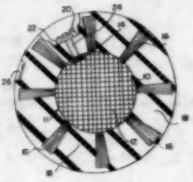
4,942,820
FRAGMENTATION DEVICE

Stephen D. Sawruk, P.O. Box 431, Lanoka Harbor, N.J. 08734

Continuation-in-part of Ser. No. 270,789, Nov. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 161,977, Feb. 29, 1988, abandoned. This application Jul. 18, 1989, Ser. No. 381,193
Int. Cl.[5] F42B *27/00*
U.S. Cl. 102—482 **12 Claims**

1. A fragmentation device, comprising
(a) a spherical munition core, the core having an exterior surface;
(b) detonation means integrally disposed within said core, said detonation means comprising electrical connection means extending radially outwardly beyond said exterior surface of said core;
(c) a thick rubberized spherical shell, said shell having a continuous spherical surface, said shell disposed about said munition core and in mechanical communication with the exterior surface of said core, said rubberized shell having therein a plurality of spherically symmetrically

radially radiating fractures terminating below said continuous outer surface of said shell, which fractures define, within said symmetrical shell, a plurality of radiating spherical segments, said fractures thereby permitting an uniform symmetrical dispersion of said spherical segments



upon detonation of said munition core and of its related explosive forces; and

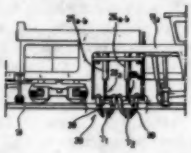
(d) in electrical communication with said detonation means, fuse means, within said rubberized shell situated within said continuous outer spherical surface thereof, for selectively actuating said detonation means.

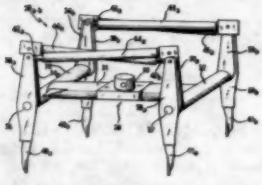
4,942,821

TAMPING MACHINE, PARTICULARLY FOR RAILROAD BALLASTS

Cesare Rossanigo, Bassignana, Italy, assignor to So.Re.Ma. Operatrici Ferroviarie Snc di Cesare Rossanigo & C., Bassignana, Italy

Filed Feb. 21, 1989, Ser. No. 313,414
Claims priority, application Italy, Mar. 9, 1988, 67194 A/88
Int. Cl.[5] E01B *27/16*
U.S. Cl. 104—12 **37 Claims**





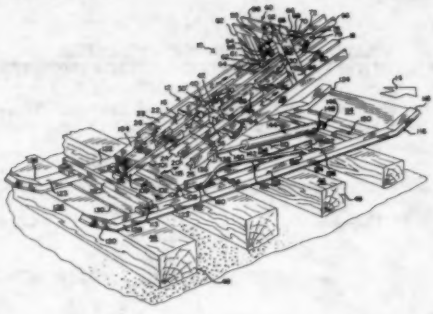
1. Tamping machine, particularly for regenerating railroad ballasts, comprising a frame, at least two pairs of vibrating tamping hammers, at least two pairs of supports, at least two pairs of fluidodynamic actuation jacks, distribution means with alternating cyclic operation, each one of said tamping hammers being rigidly connected to one of said supports, each one of said supports being pivotally connected to said frame, each one of said fluidodynamic actuation jacks being pivotally connected to one of said supports, each one of said fluidodynamic actuation jacks having a first extendable section and a second section, said distribution means feeding each said second section of each one of said fluidodynamic actuation jacks, said tamping machine further comprising first fluidodynamic actuation means and second fluidodynamic means, whereby said distribution means cause said tamping hammers to vibrate cyclically and alternatingly, said first fluidodynamic actuation means selectively and controllably cause each said first extendable section of each one of said fluidodynamic actuation jacks to expand and contract, thereby selectively and controllably moving each one of said tamping hammers between a substantially vertical working position and a substantially horizontal idle position, said second fluidodynamic means selectively cut off said distribution means to a respective said second section when a corresponding one of said tamping hammers is in idle position.

4,942,822

METHOD AND APPARATUS FOR AUTOMATICALLY SETTING RAIL TIE PLATES

Dennis J. Cotic, Waukesha, Wis., assignor to Oak Industries, Inc., San Diego, Calif.

Filed Jun. 7, 1988, Ser. No. 203,328
Int. Cl.[5] E01B *29/20*
U.S. Cl. 104—16 **26 Claims**



1. A mechanism for setting tie plates on upper surfaces of the ties for a railroad track, comprising:

a frame adapted to be moved along the track in a specified direction and having a front end and a rear end;

an inclined slide surface mounted on said frame, said slide surface having an upper end, a lower end disposed proximate to said frame rear end and adapted to accommodate a plurality of plates arranged seriatim for sliding motion thereon from said upper end toward said lower end;

releasable stop means located on said frame and adapted to regulate said movement of the plates on said slide surface to said lower end thereof said stop means releasing the plates seriatim down said slide surface;

a planar surface secured to said frame and having a portion disposed beneath said lower end of said slide surface; and

plate pusher means located on said planar surface near the lower end of said slide surface and adapted to receive each of the plates seriatim as the plates drop from said slide surface, to retract to allow each dropped plate to fall upon said planar surface, and to push each of the plates from said planar surface upon the upper surface of a respective tie in a direction opposite to the direction of movement of said frame.

4,942,823

CABLE CONVEYANCE

Bernd Meindl, Hard, Austria, assignor to Konrad Doppelmayr & Sohn Maschinenfabrik Gesellschaft m.b.H. & Co. KG, Wolfurt, Austria

Filed Aug. 3, 1989, Ser. No. 389,425
Claims priority, application Austria, Aug. 18, 1988, 2049/88
Int. Cl.[5] B61B *7/00*
U.S. Cl. 104—178 **8 Claims**

1. A cable conveyance comprising:

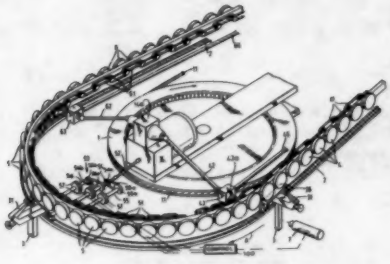
a transport cable displaceable between stations;

a plurality of carrier adapted to be affixed to said cable at

spaced-apart locations and to be decoupled from said cable; and

at least one station at which said carriers are decoupled from and recoupled to said cable, said station being provided with:

a rail supporting said carriers at said station and defining a path for carriers decoupled from said cable from an arriving side of said station to a return side of said station whereby said carriers are decoupled from said cable at an upstream side of said path and are recoupled to said cable at a downstream side of said path, said path being formed with a decelerating stretch at said upstream side and with an accelerating stretch at said downstream side defining a control stretch therebetween, each of said stretches being formed by wheels spaced apart and engageable with said carriers, whereby said carriers are decelerated from a speed of said cable along said decelerating stretch to permit passengers to dismount and passengers to mount



said carriers and are accelerated to said speed of said cable along said accelerated stretch;

a sensor along said path of carriers decoupled from said cable responding to a spacing between successive carriers, and

drive means along said path for increasing or decreasing the speed of a carrier, said drive means being provided with a controllable drive including:

a transmission provided with a plurality of shafts connected to at least some of the wheels of said control stretch and driven at different speeds and with respective clutches operatively driving said wheels of said control stretch from the respective shafts, said controllable drive enabling individual carriers to be accelerated or decelerated with respect to a normal speed of travel of said carriers through said control stretch in response to said sensor to vary the spacing of said carriers along said path and control the spacing of carriers as the carriers are recoupled to said cable.

4,942,824

ARTICULATED COUPLING FOR TWO RAIL VEHICLES

Michel Cros, La Jarne, France, assignor to Societe Anonyme dite: Alsthom:, Paris, France

Filed May 22, 1989, Ser. No. 354,560

Claims priority, application France, May 24, 1988, 88 06878

Int. Cl.[5] B61G *5/02*

U.S. Cl. 105—4.3 **7 Claims**

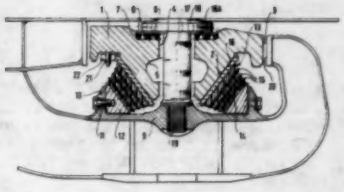
1. An articulated coupling for two rail vehicles supported by a common bogie between the two vehicles via resilient elements, wherein the coupling comprises:

(A) a toroidal part connected to one of the vehicles, having a frustoconical surface in its bottom zone and being cylindrical in its top zone, said toroidal part including a cylindrical ball through its center and being provided with a horizontal circular shoulder around the top of its cylindrical ball; and

(B) a support part connected to the other vehicle, enveloping the toroidal part and comprising:

(a) a sole plate at a lower level than the toroidal part;

(b) a toroidal articulated coupling element of resilient composite material built up from metal plates sandwiched between layers of resilient material resting on the sole plate and surrounding and in contact with the frustoconical outer surface of the toroidal part;



(c) a cylindrical peg fixed to the sole plate, engaged in the cylindrical ball of the toroidal part, being of smaller diameter than said ball and being terminated by a horizontal circular shoulder facing the horizontal circular shoulder of the toroidal part; and

(d) in the top portion of its peripheral zone, an internal cylindrical part facing the cylindrical outside surface of the top zone of the toroidal part.

4,942,825

CONNECT PLATFORM FOR RAIL VEHICLES

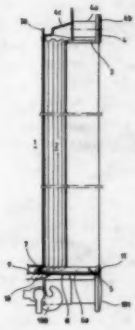
Ingo Britzke, Stellbergweg 8, D-3500 Kassel, and Peter Braemert, Rubenstrasse 2, D-3340 Wolfenbüttel, both of Fed. Rep. of Germany

Filed Mar. 3, 1989, Ser. No. 318,697

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1988, 3807167; European Pat. Off., Nov. 24, 1988, 88119662.2.0

Int. Cl.[5] B61D *17/20*; B60D *5/00*

U.S. Cl. 105—18 **24 Claims**



1. A connecting platform system for a railroad car, for cooperation with a platform system of another car articulated to said railroad car, the system comprising:

an inner end frame adapted to be fastened to an end of the railroad car,

an outer end frame having a tunnel-like configuration, spaced from the inner end frame,

a tunnel-like bellows extending between the two end frames,

spring means for supporting the outer end frame on the railroad car, the spring means holding the outer end frame away from the railroad car and toward the outer end of a platform system of another car,

a car plate fixed to the railroad car,

a bottom reinforcement joined at its outer end to the bottom of the outer end frame, the bottom reinforcement being movably supported at its inner end on the car plate, and

a platform plate resting on the reinforcement,

whereby when said railroad car and another car are coupled together, the spring means will maintain the outer end of the connecting platform system of said railroad car in engagement with the outer end of the platform system of said another car without the need for fastening means between the two platform systems.

4,942,826

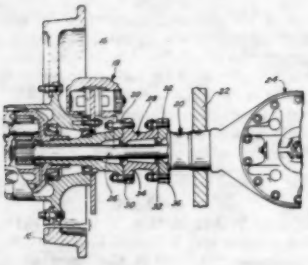
VEHICLE HAVING VARIABLE GAUGE RAIL WHEELS

Warren R. Erickson, LaGrange, Ga., and Robert L. Siewert, Loudon, Tenn., assignors to Trackmobile, Inc., LaGrange, Ga.

Filed Apr. 12, 1989, Ser. No. 336,901

Int. Cl.[5] B61F 7/00; B61D 15/00

U.S. Cl. 105—178 **14 Claims**



6. In a vehicle which comprises at least two axles which carry rail wheels and at least two axles which carry road wheels, and means for raising and lowering said rail wheel and road wheel axles relative to each other to permit selective, alternating suspension of the rail wheels and the road wheels upwardly out of supporting engagement with the ground, said rail wheel axles defining an inner, main axle housing and an outer axle housing, the improvement comprising, in combination:

a spacer of desired width secured to the outer axle housing and inner, main axle housing and positioned therebetween to longitudinally separate said outer and inner housings.

4,942,827

AUTOMOBILE DESK

Ronald Norgaard, 132 N. Prairie, Bloomingdale, Ill. 60108

Filed Dec. 14, 1988, Ser. No. 284,340

Int. Cl.[5] A47B 23/00; A47C 7/62

U.S. Cl. 108—44 **7 Claims**

1. A desk adapted for use in an interior of a vehicle having a seat including a generally vertical seat back portion and a generally horizontal seat bottom portion, comprising:

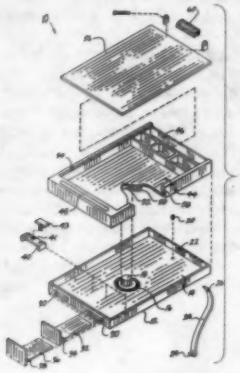
base means dimensioned for support on a conventional vehicle horizontal seat bottom portion;

retaining hook means on said base means for engagement with a bottom edge of a conventional vehicle vertical seat back portion;

tray means;

pivotal mounting means pivotally mounting said tray means on said base means, said pivotal mounting means including a cylindrical post on one of said base means or said tray means and a cooperating socket on the other of said base means or said tray means;

a circular array of equally angularly spaced radially extending projections surrounding one of said post or said socket;



a circular array of equally angularly spaced radially extending recesses surrounding the other of said post or said socket; and

said projections and said recesses in mating engagement.

4,942,828

CARRIER PLATFORM FOR THE TRANSPORT OF MOTOR VEHICLES

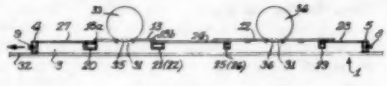
Reinhold Walz, Robdorf; Klaus Hildebrandt, Darmstadt, and Udo Willgerodt, Weiterstadt, all of Fed. Rep. of Germany, assignors to Carl Schenck AG, Fed. Rep. of Germany

Filed May 22, 1989, Ser. No. 355,465

Claims priority, application European Pat. Off., May 26, 1988, 88108383.6

Int. Cl.[5] A47G 29/00

U.S. Cl. 108—55.5 **6 Claims**



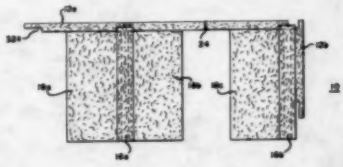
1. A carrier platform for transporting motor vehicles and the like through assembly, test and other work stations comprising a transport frame with four individual support plates connected thereto and arranged to supportingly engage vehicle wheels, the transport frame including a pair of spaced apart longitudinal spars to which the support plates are connected, two plates to each spar, and wherein the support plates include an opposed front pair constructed and arranged to engage the front wheels of a vehicle being transported and an opposed rear pair that engage the rear wheels of such vehicle, each of the support plates having an opening therein for cradling the wheels of the vehicle being transported, at least one of the opposed pairs of support plates including a slidable connection to the longitudinal spars whereby the opposed pairs are movable toward and away from one another to accomodate vehicle having different wheel base lengths.

4,942,829

WORK OF ART THAT TRANSFORMS INTO A DINING TABLE

Anne M. Harris, 40 W. 72nd St., New York, N.Y. 10023

Filed Jul. 11, 1989, Ser. No. 378,389
Int. Cl.[5] A47B 1/04
U.S. Cl. 108—79 5 Claims



1. A gateleg table having an opened position, a plurality of partially opened positions and a closed position, the table having a plurality of exterior and interior surfaces, the table comprising in combination:

a pair of base support members, each support member having a pair of sides, each side having a respective interior cavity of a predetermined size;

a pair of rectangularly-shaped drop-leaf members having a width of a predetermined dimension, each drop-leaf member operatively connected to a respective side of said support member, each drop-leaf member having a first surface and second surface opposite the first surface, each drop-leaf member having a continuous rectangular portion removed along its entire width on said second surface;

a pair of adjacent rectangularly-shaped surface members having a width of a predetermined dimension, each surface member operatively connected to a respective side of said support members, each surface member having a first surface and a second surface opposite the first surface, each surface member having a continuous rectangular portion removed along its width on said second surface;

a hinge facilitating closing of the table to said closed position and longitudinally extending substantially the entire width of said surface members, said hinge operatively mounted to the adjacent second surface of each surface member;

means to pivot each drop-leaf member in substantially a vertical direction, said means operatively connected to a respective side of said support members and to the second surface of said drop-leaf members;

means to pivot each surface member in substantially a vertical direction, said means operatively connected to a respective side of said support members and to the second surface of said surface members;

a plurality of secondary support members of a predetermined size, each secondary support member having an extended position, said secondary support members housed in said respective cavity when not in their extended position; and

means to pivot the secondary support member in a substantially a horizontal direction to their extended position.

4,942,830

PAPER-PRODUCT SHELVING CONSTRUCTION

Vincent A. Macaluso, Trappe, Pa., and Conrad Hade, South Salem, N.Y., assignors to Cornerboard, Inc., Bridgeport, Pa.

Filed Oct. 13, 1988, Ser. No. 257,356
Int. Cl.[5] A47B 3/00
U.S. Cl. 108—111 16 Claims

1. A paper-product shelving construction comprising:

a shroud formed from a single-piece paper-product and having:

(a) a back wall

(b) a first sidewall folded at 90° from said back wall,

(c) a front face folded from said first sidewall and extending parallel to said back wall, said front face having a defined opening,

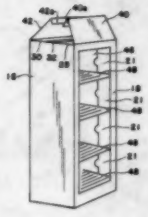
(d) a second sidewall folded from said front face and extending parallel to said first sidewall,

(e) means for attaching a free edge of said second sidewall to a free edge of said back wall,

(f) a first pair of top side flaps folded from the top of said first sidewall toward said second side-wall and forming a slot extending between said first pair of top side flaps from said first sidewall toward said second sidewall,

(g) a second pair of top side flaps folded from the top of said second sidewall toward said first sidewall and forming a slot extending between said second pair of top side flaps from said second sidewall toward said first sidewall, said slot between said second pair of top side flaps aligned with said slot between said first pair of top side flaps,

(h) a top front flap folded from the top of said front face toward said back wall and having a first locking flap folded downward into said aligned slots between said first and said second pairs of top side flaps, and



(i) a top back flap folded from the top of said back wall toward said front face and having a second locking flap folded downward into said aligned slots between said first and said second pairs of top side flaps;

and a shelving assembly fitted within said shroud and having:

(a) a first paper-product support wall positioned adjacent said first sidewall of said shroud and having a first plurality of horizontal slots extending parallel to said first sidewall of said shroud,

(b) a second paper-product support wall positioned adjacent said second sidewall of said shroud and having a second plurality of horizontal slots extending parallel to said second sidewall of said shroud, each of said slots of said second plurality of slots horizontally aligned with a slot of said first plurality of slots, and

(c) a plurality of paper-product fluted shelf members each fitted within a pair of horizontally aligned slots in said first and said second support walls.

4,942,831

DEVICE FOR THE PROTECTED STORAGE OF OBJECTS

Teunis Tel, Groningen, Netherlands, assignor to Securlock B. V., Netherlands

PCT No. PCT/NL88/00001, § 371 Date Sep. 23, 1988, § 102(e) Date Sep. 23, 1988, PCT Pub. No. WO88/05490, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 20, 1988, Ser. No. 265,136
Claims priority, application Netherlands, Jan. 23, 1987, 8700165
Int. Cl.[5] E05G 3/00
U.S. Cl. 109—29 27 Claims

1. A device for the protected storage of objects comprising:

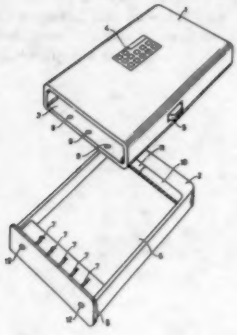
a closable container, comprising a slide having a recess defined in it for accommodating objects therein and a cassette into which the slide is insertable; the cassette, the

slide and the recess being respectively so shaped that with the slide fully inserted into the cassette, access into the recess in the slide is blocked.

damaging means in the container and communicating into the recess and being operable for damaging objects in the recess; command feeding means accessible from the exterior of the container and operable for disabling the damaging means from operating;

an electrical security shield comprising at least one electrical system which extends essentially over the entire surface of the container, including the cassette and the slide;

a processing circuit connected to each of the electrical systems for detecting an electrical parameter of the respective system, the processing circuit being connected with the damaging means for delivering an activation command to the damaging means when a detected parameter



value in any of the electrical systems deviates from a reference value and when the command feeding means has not disabled the damaging means;

each of the cassette and the slide having respective matable connecting means wherein one part of the connecting means is on the cassette and the other part is on the slide, and the connecting means being so placed on the cassette and on the slide that the matable connecting means are in engagement when the cassette is inserted into the slide and the connecting means are disengaged as the cassette is separated from the slide;

a respective set of the connecting means of the slide and of the cassette being connected with each of the electrical systems, such that when the set of connecting means of the cassette and the slide are in engagement, they are connected to the respective electrical system and are connected to the respective processing circuit.

4,942,832

METHOD AND DEVICE FOR CONTROLLING NOX EMISSIONS BY VITIATION

Harry P. Finke, Allegheny County, Pa., assignor to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed May 4, 1989, Ser. No. 347,408

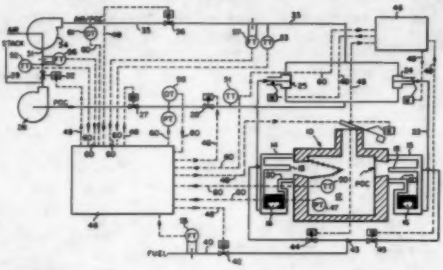
Int. Cl.[5] F23N *5/02*

U.S. Cl. 110—190 **20 Claims**

1. A furnace for controlling flame temperature and emission of NO_x comprising:

a. at least one burner to which fuel and air are supplied and products of combustion are discharged, wherein said air is vitiated with said products of combustion; and

b. means for controlling the amount of vitiation with said products of combustion as a function of at least two of an



air preheat temperature, a furnace temperature and a fuel flow rate.

4,942,833

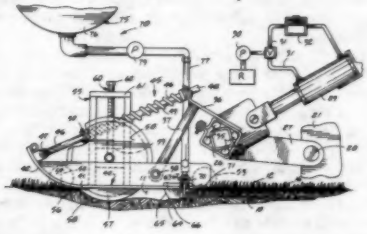
TURF TREATING PROCESS AND APPARATUS

Wallace L. Hill, 110 Willow Dr., Nezperce, Id. 83543; Leonard J. Hill, 805 Warner Dr., Lewiston, Id. 83501, and William L. Hill, 501 Beech St., Nezperce, Id. 83543, assignors to Wallace L. Hill, Nez Perce and Leonard J. Hill, Lewiston, both of, Id.

Filed Nov. 1, 1988, Ser. No. 265,834

Int. Cl.[5] A01C *21/00, 23/02*

U.S. Cl. 111—121 **15 Claims**



1. A process for subsurface treatment of turf which includes an above surface exposed growth zone having a mat of exposed plant leaf growth, a thatch zone between the exposed growth zone and a root zone containing closely spaced intermingled roots and soil while minimizing disruption of the turf, comprising the steps of:

forming a narrow slit in the turf by moving a single circular coulter disk, rotatable about a horizontal axis and having opposed substantially planar side surfaces, in a forward direction of travel with the disk rolling and cutting into the turf to form the slit through the mat at the growth zone and to a depth at least part way through the thatch zone, the slit opening upwardly at the exposed growth zone;

moving a skid plate with the coulter disk, the skid plate having a bottom surface sliding in contact with the turf and having an opening therein receiving a portion of the disk and with side walls of the opening positioned closely adjacent to the opposed side surfaces of the disk, thereby holding the turf as the disk cuts through the turf and cleaning the disk and maintaining the turf along side the slit as the disk cuts through the turf;

pressing the skid down against the turf, thereby holding the turf firmly as the disk cuts into the turf such that the slit is formed with minimal disturbance of the turf by the coulter disk;

moving a knife rigidly mounted to the skid plate and projecting from the bottom surface thereof, with a cutting edge

aligned with and behind the coulter disk to extend into the slit to a depth no greater than the slit depth along the forward path of travel and with knife side surfaces behind the cutting edge thereof holding the slit open to the width of the slit formed by the disk thereby maintaining the slit in an open condition with minimal disturbance of the turf by the knife; and

placing a turf treating material into the upwardly open slit below the growth zone through an opening in the skid plate aligned with and immediately behind the knife;

providing the knife, the coulter disk, the side plate and the opening in the skid plate in relation to one another and moving them together in relation to the turf in the forward direction of travel in such a manner that the slit formed by the coulter disk will close together over the placed turf treatment material, with the material being covered and retained by the turf below the growth zone and with the turf returning substantially to its original state.

4,942,834

LOOPER SHIFTING DEVICE IN OVERLOCK SEWING MACHINE

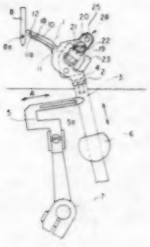
Koji Kitai, Tochigi, Japan, assignor to SSMC Inc., Edison, N.J.

Filed Jun. 5, 1989, Ser. No. 361,626

Claims priority, application Japan, Jul. 2, 1988, 63-88190[U]

Int. Cl.[5] D05B *61/00*

U.S. Cl. 112—199 **5 Claims**



1. A looper shifting device in an overlock sewing machine comprising:

a needle vertically movable and having a thread hole through which an upper thread is threaded;

an upper looper movable crossing the transfer direction of a material to be sewn and having a thread hole at a tip end portion thereof through which an upper looper thread is threaded, said upper looper comprising a side wall portion and a blade portion;

a lower looper movable swingably in lateral direction and having a thread hole through which a lower looper thread is threaded;

said needle, said upper looper thread and said lower looper thread effecting one needle three threads looping operation;

characterized in that the looper shifting device further comprising:

a guide passage having a tip end open to a base end side rear portion of the blade portion adjacent to the thread hole of the upper looper;

a horn retractably inserted into the guide passage, a tip end portion of the horn protruded from the opening of the tip end of the guide passage and the tip end side rear portion of the upper looper forming the spreader; and

a holding means provided at the upper looper for holding the base end portion of the horn.

4,942,835

OVERLOCK SEWING MACHINE WITH A LOOPER-THREAD GUIDE MECHANISM

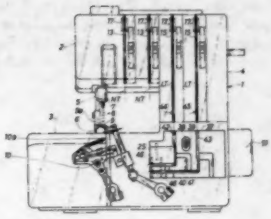
Takashi Oguri, Mizunami, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed May 30, 1989, Ser. No. 357,885

Claims priority, application Japan, May 31, 1988, 63-135192

Int. Cl.[5] D05B *1/20*

U.S. Cl. 112—302 **7 Claims**



1. An overlock sewing machine with a looper-thread guide mechanism, comprising:

a vertically moveable needle;

an over looper and an under looper, each having a thread-receiving eye at its end for forming a chain stitch in cooperation with the needle;

an over looper thread tension disk and an under looper thread tension disk, each disposed at a front of a sewing machine body for maintaining tension in each looper thread;

a takeup positioned between the loopers and the thread tension disks for taking up threads in synchrony with a sewing action of the loopers; and

thread guide means in the front of said sewing machine body having an over looper thread guide groove and an under looper thread guide groove, each thread guide groove being L shaped to guide each thread from each tension disk, through a movement area of the takeup, toward each looper.

4,942,836

LIQUID CRYSTAL INDICATING DEVICE IN A SEWING MACHINE

Yasuro Sano, and Takashi Nakamura, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,953

Claims priority, application Japan, Nov. 11, 1987, 62-171397

Int. Cl.[5] D05B *3/02*

U.S. Cl. 112—445 **3 Claims**

1. A sewing machine having a pattern data memory (**24**) for storing data of a plurality of different types of patterns which are selectively read out to control stitch forming means including a vertically reciprocating and laterally swingable needle and a fabric feeding device, and an indication data memory for storing data indicating a selected pattern in a display,

the sewing machine comprising:

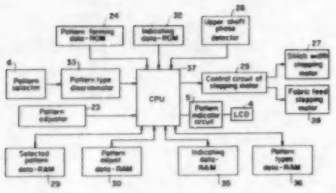
(a) pattern selecting means including a plurality of keys selectively operated to select a pattern from said pattern data memory;

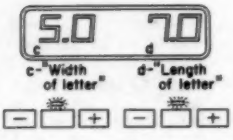
(b) discriminating means (**33**) responsive to operation of a pattern selecting key to discriminate a type of the selected pattern and to produce corresponding pattern type data;

(c) adjusting means (**23**) including two pairs of input keys selectively operated to produce data for adjusting selected patterns in predetermined modes each specific to the types of the selected patterns;

(d) first memory means (**29**) for temporally storing data for a selected pattern;

(e) second memory means (30) for temporally storing data for adjusting the selected pattern;
(f) third memory means (35) for temporally storing indication data for the selected pattern;
(g) fourth memory means (36) for temporally storing the data representing a type of the selected pattern;
(h) a central processing unit (CPU) responsive to a pattern type discriminating operation of said discriminating means to read out the pattern data and the pattern indication data from said pattern data memory (24) and said indication data memory (32) respectively, and to store said pattern data and said indication data in said first and third memory means, respectively, while operating said display (4) to indicate the selected pattern





thereon, and simultaneously store said pattern type data of the selected pattern in said fourth memory means (36), said central processing unit being responsive to selective operation of said adjusting means to write said pattern adjusting data into said second memory means in reference to said pattern type data stored in said fourth memory means, and simultaneously to read out indication data for said pattern adjusting data from said indication data memory and to write the same into said third memory means while operating said display to indicate thereon said pattern adjusting data, and said central processing unit processing the data stored in said first, second and fourth memory means to control said stitch forming means.

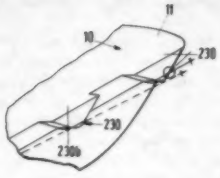
4,942,837

ICE BREAKER

Jens-Holger Hellmann, Hamburg; Richard Hölscher, Embsen; Hermann J. Janssen; Alfred Kleemann, both of Emden; Karl-Heinz Rupp, Hamburg; Joachim Schwarz, Hansdorf; Günter Varges, Emden, and Heinrich Wacs, Bonn, all of Fed. Rep. of Germany, assignors to Thyssen Nordseewerke GmbH, Emden, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 302,006
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 8802053[U]
Int. Cl.[5] B63B *35/12, 35/08*
U.S. Cl. 114—40 **13 Claims**

1. In an icebreaker having a hull with a forebody and a horizontally extending water line defining hull portions above and below said water line, the improvement to such hull forebody comprising first and second laterally projecting hull components, said first component having an inclined face for engagement with the ice to be broken, said face being inclined upwardly in the forward direction, and said face including a portion above and a portion below the water line, said first projecting hull component further including a longitudinally extending lateral face with portions both above and below the said water line and cooperating with said inclined face to define a first cutting edge, and said second laterally spaced



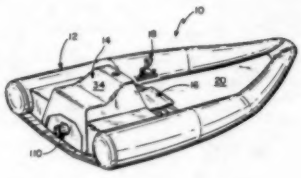
projecting hull component being located adjacent said first projecting component, said second component also including a said longitudinally extending lateral face and a said upwardly inclined face so as to define a second cutting edge downstream of said first cutting edge.

4,942,838

INFLATABLE WATERCRAFT WITH PORTABLE ENGINE PACKAGE

Kirk A. Boyer, Lino Lakes, and Shigeki Yonezawa, Coon Rapids, both of Minn., assignors to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kagyo Kabushiki Kaisha, both of, Japan

Filed Jun. 23, 1989, Ser. No. 370,845
Int. Cl.[5] B63B *7/08*
U.S. Cl. 114—345 **7 Claims**



1. A manually portable watercraft comprising, in combination:
(a) a rigid hull member having a relatively wide, generally rectangular stern portion tapering to a more narrow bow portion;
(b) a plurality of tubular inflatable chamber members secured to said hull member and extending along the opposed side edges thereof from said stern portion to said bow portion;
(c) a baseplate permanently inset in said hull member midway between said opposed side edges proximate the stern portion, said baseplate including a water inlet port extending therethrough;
(d) a manually portable internal combustion engine driven pump module, the pump in said module having a low pressure water inlet and a high pressure water outlet;
(e) deflector means pivotally coupled about a vertical axis relative to said high pressure water outlet for controlling the direction of the water stream exiting said outlet;
(f) means for rapidly coupling and uncoupling said module to said hull member over said baseplate such that when said module is coupled to said hull member, said low pressure water inlet of said pump is in fluid communication with said water inlet port in said baseplate and said high pressure water outlet is pointed in the aft direction at a location above said hull member; and
(g) a joystick lever means releasably attached on one of said

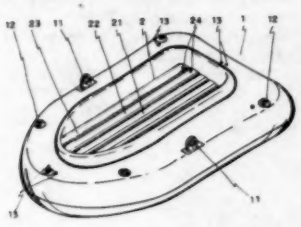
inflatable chamber members at a location in reach of an operator to be removable with said module and said joystick lever means being adapted to be connected to said deflector means for pivoting said deflector means.

4,942,839

STABILIZED AND FOLDABLE SAFETY INFLATABLE BOAT

Chang C. Chuan, No. 32, Ching An Hsing Tswen, Ta Pwu Rd., Chi An Village, Jwei Fang Town, Taipei, Taiwan

Filed Apr. 21, 1989, Ser. No. 341,160
Int. Cl.[5] B63B *39/03*
U.S. Cl. 114—345 **1 Claim**



1. A stabilized and foldable safety inflatable boat having an adjustable attitude, comprising:

a body housing formed of a flexible material composition defining a closed cavity having a boat-like contour;

buoyancy means formed in an internal upper portion of said body housing for providing flotation for said boat, said buoyancy means includes a plurality of independent closed chambers adapted for filling with a predetermined volume of air;

stabilization means formed in an internal lower portion of said body housing for containing ballast to stabilize said boat, said stabilization means includes a plurality of closed chambers adapted for filling with a selected volume of water, whereby said attitude is adjusted by selectively changing said volume of water; and,

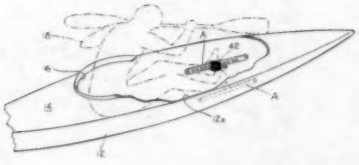
a mattress body means disposed in an external cavity formed in said body housing for supporting a user of said boat, said mattress body means includes a pair of independent chambers disposed in a serpentine-like planar contour, wherein one of said pair of chambers is filled with water and the other filled with air for providing improved support of said user.

4,942,840

FOOT BRACE FOR KAYAKS

William E. Masters, 313 Dogwood La., Easley, S.C. 29640, and Roger A. Williams, 327 Pinehurst, Mauldin, S.C. 29662

Filed Feb. 12, 1988, Ser. No. 155,596
Int. Cl.[5] B63B *35/72*
U.S. Cl. 114—363 **17 Claims**



1. A foot brace for a kayak of the type having a hull with an upper deck, a cockpit having a cockpit opening in which a boater is seated comprising:

an elongated flange bar carried by said hull inside an interior of said kayak extending in forward and aft directions;

an adjustable foot rest bracket slidably carried by said flange bar having a foot rest projecting laterally from said flange bar and inwardly towards a center of said hull interior so that a boater seated in said cockpit may brace a foot on said foot rest;

means for adjusting the position of said adjustable foot rest bracket along the length of said flange bar including a plurality of index openings formed in said flange bar and a cam means for engaging within said openings;

said cam means being formed on one end of a molded one piece operator lever having a flexible stem integrally attached to said adjustable foot rest bracket in a manner that a flexible joint is created between said operator lever and said adjustable foot rest bracket; and

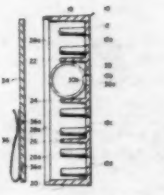
an operator portion formed on said operator lever for moving said camming means in and out of said index openings as said operator lever flexes about said flexible joint.

4,942,841

VEHICLE SERVICE REMINDER DISPLAY

Jack L. Drucker, Jr., 2653 Halm Ave., Los Angeles, Calif. 90034

Filed Jun. 15, 1989, Ser. No. 366,471
Int. Cl.[5] G09F *11/12*
U.S. Cl. 116—317 **5 Claims**



1. An automotive vehicle service reminder display device comprising in combination:

(a) a shallow case consisting of a rectangular face wall having a series of indicia viewing ports, elongated side walls and end walls enclosing a central chamber for receiving indicia wheels, said case containing at least two divider walls extending from the inside surface of said face wall is parallel alignment with said end walls, said indicia viewing ports being centrally aligned between said divider walls and between said divider walls and the end walls of said case and said indicia viewing ports having associated therewith on the outside of said face wall vehicle service nomenclature;

(b) a plurality of indicia wheels of like diameter positioned in rows of two or more of said wheels between the divider walls and between the divider walls and the end walls of said case, said wheels each having on their periphery an appular series of like imprintable indicia display surface areas said indicia display areas being defined by detent grooves which interlock with the edges of said indicia viewing ports;

(c) means within said case for maintaining the rows of indicia wheels between said divider walls and between said divider walls and said end walls;

(d) closure means for said case mounted to the outer edges of said side walls and said end walls for closing said case and for maintaining said indicia wheels therein with pairs of the detent grooves of each of said wheels in contact with the edges of said indicia viewing ports; and

(e) indicia representing a variety of vehicle service information and data imprinted on the display surface areas of said indicia wheels, said wheels being rotatable under finger

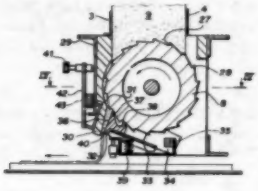
pressure through said viewing ports to align appropriate indicia information and data with said ports as displayed service information and data.

4,942,842

APPARATUS FOR COATING SHEETS OF DOUGH WITH FAT

Peter Siegenthaler, Toffen, and Andreas Zwahlen, Burgdorf, both of Switzerland, assignors to Seewer AG, Burgdorf, Switzerland

Filed Jan. 9, 1989, Ser. No. 295,200
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1988, 3800516
Int. Cl.[5] B05C *5/02*
U.S. Cl. 118—24 14 Claims



14. In an apparatus for coating sheets of dough with fat having a container for receiving at least one block of fat, a nozzle space, and conveyor means for conveying the fat from the container to the nozzle space, wherein the improvement comprises:

fat-grasping means forming part of said conveyor means, said fat-grasping means having the shape of circular-saw teeth,

a stripper component forming part of said conveyor means for at least partially removing fat from said fat-grasping means and conveying it to said nozzle space, and

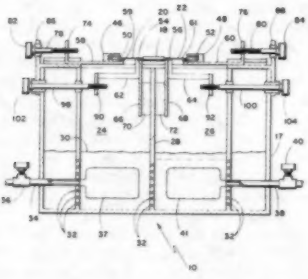
a nozzle orifice disposed at one end of said nozzle space.

4,942,843

AUTOMATED LEAD WIRE TINNING APPARATUS MECHANICAL ADJUSTMENTS AND IMPROVEMENTS

Mark J. Shireman, Minnetonka, and Florence G. Benson, St. Michael, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 5, 1988, Ser. No. 253,295
Int. Cl.[5] B05C *1/02, 3/02, 3/10*
U.S. Cl. 118—74 7 Claims



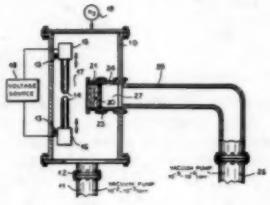
1. In apparatus for automatically tinning component leads having solder wave means and foam flux means with means for carrying components over the flux and solder wave means for fluxing and tinning opposed component leads, the improvement comprising: the flux means being separate foam flux generating means; each having separate flow rate adjustment means, provided for each lead of a component, the means for carrying components being arranged such that as the components are carried over a foam flux means opposed component leads will be simultaneously immersed in foam flux from the separate foam generating means; with the foam flux height relative to each lead established independently by the separate rate adjustment means.

4,942,844

HIGH PENETRATION DEPOSITION PROCESS AND APPARATUS

Eduard Pinkhasov, Eastchester, N.Y., assignor to Vapor Technologies Inc., Mt. Vernon, N.Y.

Division of Ser. No. 276,068, Nov. 25, 1988. This application Dec. 6, 1989, Ser. No. 446,928
Int. Cl.[5] C23C *14/24*
U.S. Cl. 118—723 6 Claims



1. An apparatus for effecting filling of interstices of a body with a deposited material, comprising:

means defining two chambers on opposite sides of said body;

means for evacuating one of said chambers to a subatmospheric pressure adapted to sustain vapor formation by an electrical discharge;

means for effecting an electrical discharge in said one of said chambers to vaporize a substance therein; and

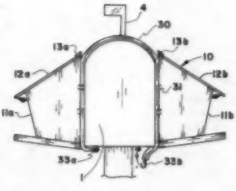
means for evacuating the other of said chambers to a lower subatmospheric pressure and a higher vacuum than that in said one of said chambers and thereby inducing said substance to penetrate into said body and deposit in interstices thereof in the form of a deposited material.

4,942,845

BIRDFEEDER ATTACHABLE TO A MAILBOX

Fred J. Lane, 1475 E. McDaniel, Springfield, Mo. 65802

Filed Sep. 18, 1989, Ser. No. 408,368
Int. Cl.[5] A01K *39/014*
U.S. Cl. 119—52.2 8 Claims



1. A birdfeeder for attachment to a hollow enclosure including:

a hollow enclosure for mounting said birdfeeder upon;

two hoppers to contain animal feed, each said hopper having

a rear face mounted adjacent and abutting an opposite side each of said hollow enclosure;

a cover disposed over each said hopper that is displaceable to reveal the interior of said hopper;

a feeding tray disposed below each said hopper;

feeding apertures disposed in a lower portion of each of said hoppers over said feeding trays to allow animal feed to flow out of said hoppers into said feeding trays;

a perch adjacent each said feeding tray to allow animals such as birds to alight and feed from said feeding trays; and

at least one flexible mounting strap having the rear face of each said hopper mounted to it such that said rear faces face each other and said at least one strap is mounted over the top of said hollow enclosure with the at least one mounting strap and said rear faces abutting opposite sides of said hollow enclosure.

4,942,846

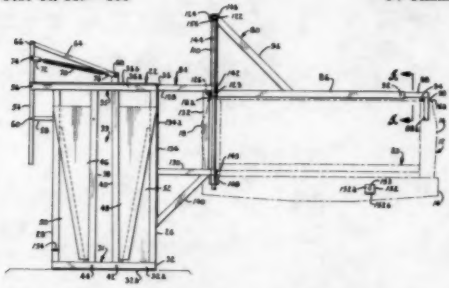
PORTABLE HEADCATCH SUPPORT AND ANIMAL RESTRAINING MECHANISM

John E. Reinhold, Rte. 70, Box 679, and James F. Wilsman, Rte. 80, Box 228, both of Camdenton, Mo. 65020

Filed Apr. 6, 1988, Ser. No. 178,351

Int. Cl.[5] A61D *3/00*

U.S. Cl. 119—103 **34 Claims**



1. An animal restraining mechanism comprising:

a vehicle;

a headcatch for temporarily capturing and restraining said animal; and

means for mounting said headcatch on said vehicle in order that said headcatch can rotatably move between a storage position and a capturing position in a manner permitting said vehicle to form a part said restraining mechanism when said headcatch is rotated said capturing position adjacent said vehicle by providing a barrier in one direction to movement by said animal.

4,942,847

GENERATION AND ACCUMULATION OF STEAM

Lauri Santasalo, Helsinki, and Esko Huhta-Koivisto, Espoo, both of Finland, assignors to Oy Santasalo-Sohlberg AB, Finland

Filed Jan. 27, 1989, Ser. No. 303,160

Claims priority, application Finland, Jan. 28, 1988, 880392

Int. Cl.[5] F22B *37/22*

U.S. Cl. 122—35 **16 Claims**

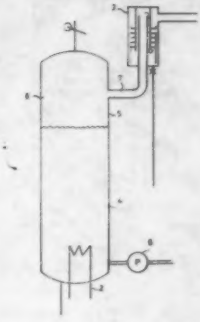
1. Procedure for generating and accumulating steam for an autoclave or equivalent steam-operated device, comprising the steps of

heating water in a closed tank which is only partially filled with the water until the unfilled portion of the tank contains steam under pressure, thus also causing the water in the tank to be under pressure,

storing thermal energy in the the water that is under pressure,

removing stored steam from the autoclave as required, thus generating steam from at least part of the water stored under pressure,

maintaining heat on the water under pressure to replace thermal energy thereof which is lost upon conversion of water in the tank to steam,



whereby steam is accumulated in the autoclave or equivalent device as steam is removed therefrom for use, and the load of the autoclave or equivalent device is equalized by the steam therein.

4,942,848

AIR-FUEL RATIO CONTROL SYSTEM FOR AUTOMOTIVE INTERNAL COMBUSTION ENGINE OR THE LIKE WITH FUEL TYPE DISCRIMINATION CAPABILITIES

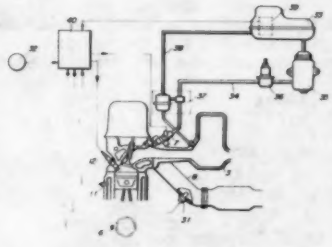
Katsunori Terasaka, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 29, 1988, Ser. No. 188,510

Claims priority, application Japan, Apr. 30, 1987, 62-107365; Aug. 6, 1987, 62-196971

Int. Cl.[5] F02D *41/14*; G01N *33/22*

U.S. Cl. 123—1 A **11 Claims**



1. A method, comprising:

sensing the magnitude of a first parameter, said first parameter having a predetermined relationship with the nature of the fuel supplied to a cylinder of an internal combustion engine;

comparing the magnitude of said first parameter with a first predetermined value;

sensing a temperature which varies with the temperature of the engine in the event that the magnitude of said first parameter exceeds said predetermined value;

determining a correction factor using said temperature; and

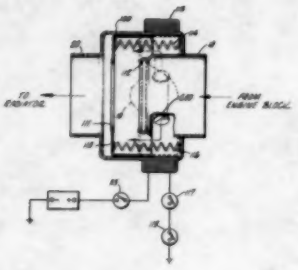
using the correction factor in an engine control.

4,942,849

FAIL-SAFE COOLANT THERMOSTAT SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Vernon E. Shelton, 430 Top Hill Dr., Tyler, Tex. 75703

Filed Apr. 6, 1989, Ser. No. 334,580
Int. Cl.[5] F01P 7/14
U.S. Cl. 123—41.1 **7 Claims**



1. In a device for controlling the flow of cooling fluid between a fluid-cooled engine and a radiator, wherein a primary passage is provided with a thermostat that normally controls the flow of cooling fluid between the engine and the radiator, the improvement comprising:

a bypass passage connected in parallel with said primary passage and thermostat;

a control valve contained within said bypass passage, said valve comprising a solenoid operated cup-shaped valve body and means for continually urging open said valve toward an open position; and

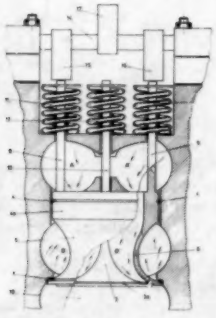
means for de-energizing the solenoid for positioning said control valve in an open condition when either the engine is not operating or the cooling fluid temperature exceeds a predetermined level, and for energizing the solenoid for positioning said control valve in a closed condition when the engine is operating and the cooling fluid temperature is below said predetermined level.

4,942,850

DOUBLE-FLOW VALVE FOR INTERNAL COMBUSTION ENGINES

Angel G. Hernandez, Somontin, no 116, Madrid, Spain

Filed Mar. 9, 1989, Ser. No. 321,213
Claims priority, application Spain, Mar. 17, 1988, 8800810
Int. Cl.[5] F01L 1/28
U.S. Cl. 123—79 C **7 Claims**



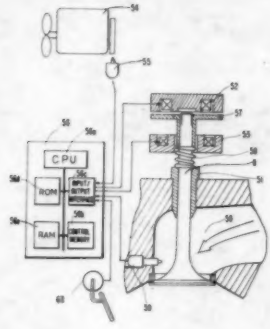
1. A two-way valve for internal combustion engines, wherein there is a main body which is bowl shaped, and containing a cylindrical hollow, wherein at the top of said hollow, it connects with two cylindrical bars placed symmetrically, and at the bottom of said hollow, inside, there is a truncated cone shaped seating area which receives the adjustment of a standard design valve, outside said hollow at the bottom there is an area which extends outwardly from the bowl, and which is machined on top into a truncated cone, which serves to adjust into the body of the cylinder head, said symmetrical cylindrical bars projecting toward the top of the cylinder head, to receive the thrust from two cams on a camshaft, this two-way valve also having a cylindrical area with at least one circular groove into which an expansion ring is adjusted and which expands against a cylindrical zone in the cylinder head.

4,942,851

ELECTROMAGNETIC VALVE CONTROL SYSTEM

Hideo Kawamura, Kanagawa, Japan, assignor to Isuzu Ceramics Research Co., Ltd., Kanagawa, Japan

Filed Nov. 13, 1989, Ser. No. 435,942
Claims priority, application Japan, Nov. 11, 1988, 63-285373
Int. Cl.[5] F01L 9/04
U.S. Cl. 123—90.11 **14 Claims**



1. An electromagnetic valve control system for controlling the timing of opening and closing an intake valve in an internal combustion engine, comprising:

a magnetic plate adapted to be connected to the intake valve, said magnetic plate being reciprocally movable in a direction;

electromagnets having fixed magnetic poles facing end surfaces of said magnetic plate in said direction;

a flow speed sensor for detecting the speed of flow of intake air toward said intake valve in the internal combustion engine;

valve opening and closing means for opening and closing the intake valve under attractive forces produced between said magnetic plate and said fixed magnetic poles by energizing said electromagnets; and

timing modifying means for modifying the timing of closing the intake valve such that the intake valve will be closed by said valve opening and closing means at the time the speed of flow of intake air as detected by said flow speed sensor becomes zero.

4,942,852

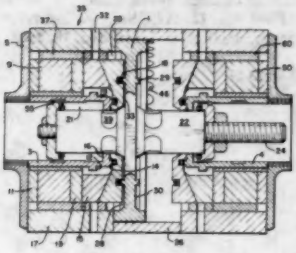
ELECTRO-PNEUMATIC ACTUATOR

William E. Richeson, and Frederick L. Erickson, both of Fort Wayne, Ind., assignors to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Jan. 6, 1989, Ser. No. 294,729
Int. Cl.[5] F15B 11/08, 13/04; F01B 11/02
U.S. Cl. 123—90.14 **11 Claims**

1. A bistable electro-pneumatic transducer having a piston

reciprocable along an axis between first and second positions; a source of high pressure air; a selectively enableable control valve having an enabled position for selectively supplying high pressure air to the piston to move the piston from one of said positions to the other; a permanent magnet latching arrangement for maintaining the control valve in a disabled position and for holding the piston in the corresponding one of the first



and second positions; electromagnetic means for temporarily neutralizing the latching arrangement to release the control valve to move from the disabled position to the enabled position; energization of the electromagnetic means causing movement of the control valve in one direction along the axis and applying high pressure fluid to a portion of the piston to drive the piston in the opposite direction from one position to the other position along the axis.

4,942,853

VALVE OPERATING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

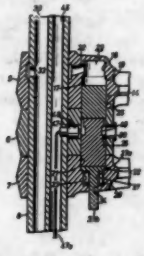
Tsuneo Konno, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 105,209, Oct. 7, 1987, Pat. No. 4,759,322. This application May 18, 1988, Ser. No. 195,310

Claims priority, application Japan, Oct. 23, 1986, 61-252622; May 26, 1987, 62-127178

Int. Cl.[5] F01L *1/26, 1/24, 1/34*

U.S. Cl. 123—90.16 **8 Claims**



1. Apparatus for operating at least one of intake or exhaust valves in an internal combustion engine including a plurality of rocker arms for opening and closing said valves; cam means for driving said rocker arms to impart a mode of operation to said valves; and means for varying the mode of operation of said valves, comprising:

mutually registrable guide holes in said rocker arms;

piston means carried by said rocker arms in said guide holes;

means for selectively moving said piston means between adjacent guide holes for connecting or disconnecting said rocker arms; and

electrically operated sensing means for determining the positional condition of said piston means.

4,942,854

VALVE OPERATING DEVICE FOR USE IN INTERNAL COMBUSTION ENGINE

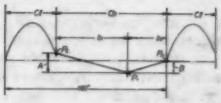
Hiroshi Shirai; Takashi Tatsumi; Hisashi Kanda; Koichi Fukuo; Masahiko Motsumoto, and Toshiaki Hiro, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

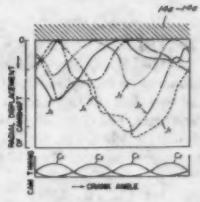
Filed Mar. 2, 1989, Ser. No. 317,771

Claims priority, application Japan, Mar. 3, 1988, 63-50426; Apr. 1, 1988, 63-81602; May 30, 1988, 63-132499; May 30, 1988, 63-132500; May 30, 1988, 63-132501

Int. Cl.[5] F01L *1/34, 1/08*

U.S. Cl. 123—90.17 **26 Claims**





25. A valve operating device for operating a plurality of engine valves in an internal combustion engine, comprising:

a plurality of valve springs for normally urging the engine valves in a closing direction;

a plurality of cams having respective cam profiles including respective valve lifting portions for applying forces to open said engine valves and respective base circle poritons for allowing said valves to be closed;

transmitting means for transmitting the force from each of said cams to said engine valve;

a hydraulic lash adjuster combined with said transmitting means for eliminating any gap between said means and each of said engine valves; and

the base circle portions of at least selected ones of said cams having profiles differing from the profiles of the base circle poritons of the others of said cams dependent upon the respective radial displacements thereof in a direction to lift the engine valves.

4,942,855

LUBRICATING SYSTEM OF A VALVE MECHANISM FOR A DOUBLE OVERHEAD CAMSHAFT ENGINE

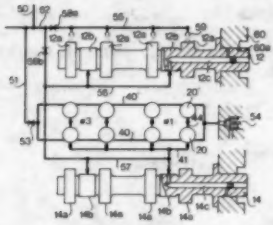
Naoto Muto, Kawasaki, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1989, Ser. No. 425,801

Claims priority, application Japan, Oct. 29, 1988, 63-142187[U]

Int. Cl.[5] F01M *1/06*

U.S. Cl. 123—90.33 3 Claims



1. A lubricating system of a valve mechanism for a double overhead camshaft engine having opposed cylinders, an intake valve and an exhaust valve which are disposed one above the other in a vertical plane, camshafts, rocker arms and hydraulic valve-lash adjusters, characterized in that the system has:

a main oil gallery provided for supplying pressurized oil to the valve mechanism;

a first gallery connected with the main gallery for supplying first lubricating oil to the hydraulic valve-lash adjusters;

means for keeping pressure of the first lubricating oil constant;

a second gallery connected with the main gallery for supplying second lubricating oil to journals of the camshafts;

a third gallery connected with the main gallery;

nozzles connected with the third gallery for ejecting third lubricating oil to the camshaft and rocker arm of the upper valve.

4,942,856

IGNITION DISTRIBUTOR FOR AN INTERNAL COMBUSTION ENGINE

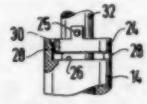
Friedrich Jaki, Erdmannhausen, and Hartmut Brammer, Vaihingen/Enz., both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 10, 1989, Ser. No. 377,391

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1988, 3830900

Int. Cl.[5] F02P *7/02*

U.S. Cl. 123—146.5 A 20 Claims



1. An ignition distributor for internal combustion engines having a distributor shaft coupled to a drive device via a claw coupling (29), comprising a first coupling part disposed coaxially on the distributor shaft (32) and firmly mounted on the distributor shaft (32) by means of a connecting element (25), a second coupling part (20) disposed on the distributor shaft (32), further in which the claw coupling (29) includes claws (28) which are formed onto the second coupling part (20) and form-fittingly engage the inside of at least one recess (30; 130; 230; 330) in the first coupling part, and the at least one recess (30; 130; 230; 330) in the vicinity of the claw engagement comprise dimensionally stable wear-resistant plastic having self-lubricating properties.

4,942,857

COMBUSTION CHAMBER FOR ENGINE WITH MULTIPLE VALVES

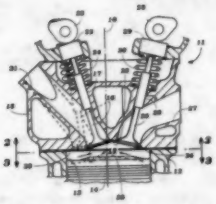
Masaaki Yoshikawa, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

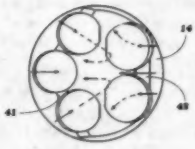
Filed Jan. 12, 1989, Ser. No. 296,497

Claims priority, application Japan, Jan. 18, 1988, 63-6984

Int. Cl.[5] F02B *15/00*

U.S. Cl. 123—193 H 9 Claims





1. In a combustion chamber for an internal combustion engine comprised of a cylinder bore, a piston reciprocating in said cylinder bore, a cylinder head closing said cylinder bore and defining a combustion chamber with said cylinder bore and said piston, intake valve means on one side of said cylinder bore for admitting a charge to said combustion chamber, and exhaust valve means on the other side of said cylinder bore for discharging of combustion products from said combustion chamber, the improvement comprising said combustion chamber being comprised of a central portion having a pent roof configuration with a peripheral squish area and being configured that the squish flow upon approaching top dead center of said piston is such that the squish flow from one side of the cylinder bore is in a different direction than the squish flow from the other side of the cylinder bore and does not directly oppose the squish flow from the other side of the cylinder bore.

4,942,858

CYLINDER HEAD FOR AIR-COMPRESSING, SELF-IGNITION INTERNAL COMBUSTION ENGINES

Wolf-Dietrich Wagner, Stuttgart; Rolf Klumpp, Kernen; Wolfgang Strobel, Remshalden, and Günter Brenker, Waiblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed May 4, 1989, Ser. No. 347,057

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1988, 3819656

Int. Cl.[5] F02F *1/42, 1/36;* F02B *19/16;* F01P *3/16*

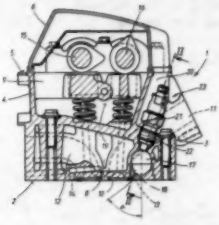
U.S. Cl. 123—193 H 5 Claims

1. Cylinder head for air-compressing, self-ignition fuel-injection internal combustion engines with several cylinders, comprising:

a cylinder head bottom having substantially planar combustion space sections;

a coolant space extending from the cylinder head bottom to the cylinder head top;

inlet and outlet ducts penetrating the coolant space from an opening in each of the combustion space sections, the inlet and outlet ducts respectively extending towards opposite sides of the cylinder head each in a direction transverse to the longitudinal axis of the cylinder head;



auxiliary combustion chambers located in a transverse center plane of the cylinder head extending between the inlet ducts in a region of a periphery of the combustion space section; and

a cylinder head top which extends downwards at an angle across substantially an entire transverse width of the cylinder head in a direction transverse to the cylinder head towards the auxiliary combustion chambers in such a way that upper parts of the auxiliary combustion chambers directly touch a bottom side of the cylinder head top and are immediately adjacent to the cylinder head top.

4,942,859

SAFETY SYSTEM FOR AN AUTOMOTIVE ENGINE

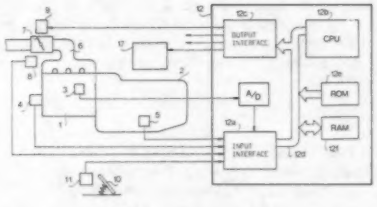
Koji Morikawa, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1989, Ser. No. 344,271

Claims priority, application Japan, Apr. 30, 1988, 63-059606[U]

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—198 D **2 Claims**



1. A safety sytem for an automotive engine of a motor vehicle having an accelerator pedal for controlling a throttle valve of the engine and a transmission for transmitting power of the engine to wheels of the vehicle, comprising:

an accelerator pedal sensor for detecting release of the accelerator pedal and for producing a release signal;

a torque sensor for detecting output torque of the transmission and for producing a torque signal representing the detected torque;

comparator means responsive to the release signal for comparing the detected torque represented by the torque signal with a predetermined value and for producing an abnormality signal when the detected torque is larger than the predetermined value; and

stopping means responsive to the abnormality signal for stopping operation of the engine.

4,942,860

ENGINE CONTROL SYSTEM

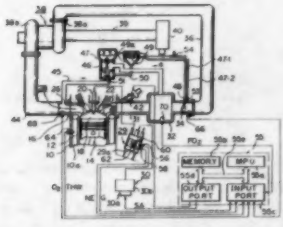
Yoshiki Chujo; Tokuta Inoue, both of Mishima; Toshiaki Konomi, and Yoshihiko Hyodo, both of Hyodo, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 2, 1988, Ser. No. 151,422

Claims priority, application Japan, Feb. 6, 1987, 62-024824; Feb. 6, 1987, 62-024827; Apr. 8, 1987, 62-084861

Int. Cl.[5] F02M *25/06*

U.S. Cl. 123—571 **16 Claims**



1. An internal combustion engine comprising:

an engine body;

an intake system connected to the engine body for introducing air thereto from outside the engine, the system including a throttle valve for controlling the amount of air introduced;

an exhaust system connected to the engine body for removing resultant combustion gas therefrom;

sensor means arranged in the intake system at a position downstream of the throttle valve, said sensor means being responsive only to the partial pressure of oxygen in the air newly introduced from outside the engine and providing an electrical signal indicating the amount of new air introduced;

calculating means, responsive to the sensed amount of new air introduced, for calculating values of an engine operational characteristic to be controlled as a function of the amount of newly introduced air; and

control means, responsive to the calculated engine operational characteristic value, for controlling the engine operational characteristic as a function of the amount of newly introduced air.

4,942,861

CROSS BOW WITH IMPROVED COCKING MECHANISM

John W. Bozek, 6093 Waterfront Dr., Waterford, Mich. 48095

Continuation of Ser. No. 859,698, May 5, 1986, abandoned, which is a continuation-in-part of Ser. No. 778,316, Sep. 20, 1985, Pat. No. 4,649,892. This application Mar. 28, 1988, Ser. No. 178,763

Int. Cl.[5] F41B *5/00*

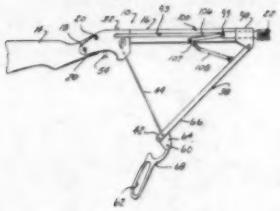
U.S. Cl. 124—25 **7 Claims**

1. A cross bow comprising; an elongated stock member having a forward end and a rear end; a drawstring means having end string segments and a drawstring means midportion connected to said end string segments, said drawstring means extending transversely to said stock member with the drawstring means midportion thereof located at the stock member able to undergo drawing movement; spring means for generating a spring force acting on said drawstring means midportion, said spring force increasing with increasing drawing move-

ment thereof so as to urge said drawstring means midportion to a restored position, said spring force reaching a predetermined peak level at a fully drawn position of said drawstring;

trigger means carried on said stock member adjacent the rear end thereof for releasably securing said midportion of said drawstring means in a fully drawn position;

cocking means comprising a cocking lever mounted on said stock member and means causing said cocking lever to act on said spring means upon movement thereof in forward and return movements in opposite direction, movement of said cocking lever in said forward direction acting on said



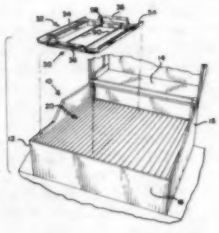
drawstring to draw said drawstring means midportion to said fully drawn position, and simultaneously acting on said spring means to at least partially nullify the generation of said spring force when said drawstring means midportion is fully drawn, by reducing the level at which said spring force otherwise peaks, and upon return movement said means causing said cocking lever to act on said spring means to generate said spring force at said peak level with the aid of a mechanical advantage, whereby reducing the effort otherwise required in drawing the drawstring means midportion to the fully drawn position.

4,942,862

UNIVERSAL RACK FOR BARBECUE GRILL

J. Michael Alden, Palatine; Erich J. Schlosser, Barrington, and James C. Stephen, Arlington Heights, all of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.

Filed Aug. 7, 1989, Ser. No. 390,643
Int. Cl.[5] F24C *15/00*
U.S. Cl. 126—337 R **8 Claims**



1. A universal food holder for a barbecue grill comprising

a peripheral frame member adapted to be supported in a grill above a heat producing source and having food support elements thereon,

said frame being generally rectangular and having opposite sides and opposite ends to define an open space between said sides and said ends, said opposite sides each including a generally L-shaped side member having a vertical leg and a generally horizontal leg with slot means in said horizontal leg, and

said food support elements comprising elongated members having cooperating connections at opposite ends releasably received into said slot means

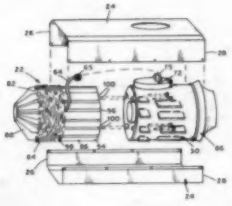
so that said food support elements may be releasable from said frame member for cleaning.

4,942,863

THERMOELECTRIC GENERATOR FOR USE IN A HEATER AND METHOD OF INSTALLATION

Der-Jeou Chou, Taipei, Taiwan, and John C. Young, 408 N. Cedar Bluff Rd., Suite 200, Knoxville, Tenn. 37923, assignors to John C. Young, Farragut, Tenn.

Filed Apr. 6, 1989, Ser. No. 334,595
Int. Cl.[5] F24H *3/02*
U.S. Cl. 126—110 E **17 Claims**



1. A thermoelectric generating assembly for use in a fuel-burning heater designed to utilize a heat exchanger of a predetermined size and shape and wherein the fuel-burning heater includes a burner assembly for generating heat and components which require electrical power for heater operation such as means for moving a heat exchange medium through the heater so that the heat exchange medium is heated by the heat generated by the burner assembly through the heat exchanger, said assembly comprising a body including:

a thermoelectric generator; and

means for mounting the thermoelectric generator in such a relationship to the burner assembly and to the heat exchange medium routed through the heater so that the thermoelectric generator generates electricity for supplying at least a portion of the electrical power requirements of said heater components,

said assembly body possessing a size and shape which approximates that of the heat exchanger with which the fuel-burning heater is designed to be utilized and

said mounting means is compatible with means utilized for mounting the heat exchanger with which the fuel-burning heater is designed to be utilized within the heater so that said assembly can be mounted within the heater in place of the heat exchanger with which the heater is designed to be utilized.

4,942,864

STOVE-TOP SAFETY GRATE FLAME DEFLECTOR

Frank Esposito, 83-15 13th Ave., Apt. 1, Brooklyn, N.Y. 11228

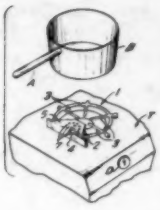
Filed Aug. 16, 1989, Ser. No. 394,580
Int. Cl.[5] F24C *15/10*
U.S. Cl. 126—214 D **20 Claims**

1. A stove-top flame safety deflector which prevents the handle of a pot or other cooking utensil from being heated higher than can be tolerated for hand contact and which can be mounted on existing stove grates located above the gas burners of a stove, which grate has a plurality of generally radially extending fingers, said deflector comprising:

a generally flat upper deflector plate formed generally in the shape of a truncated wedge said deflector plate having an inner edge facing the stove burner and an outer edge spaced from the burner, and a pair of generally oppositely disposed edges, said outer edge having a downwardly extending lip which generally abuts the stove top when

said deflector plate rests atop the fingers of the stove grate;

a protective skirt member projecting angularly downwardly from said deflector plate, from its bottom, said skirt member extending lower than the lip on said outer edge when



installed on a stove grate, such that when said deflector is located in desired position on the stove grate, the combination of said deflector plate, protective skirt and said outer edge lip substantially prevents flames from the burner from heating the handle beyond the level for safe hand contact.

4,942,865

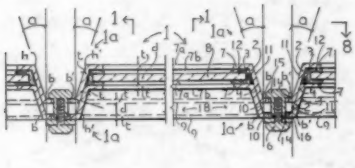
COMPOUND SOLAR COLLECTOR BUILDING CONSTRUCTION

Patricia Pierce-Bjorklund, P.O. Box 908, 15 Spring St., Essex, Mass. 01929

Continuation-in-part of Ser. No. 81,216, Aug. 3, 1987, abandoned. This application Jun. 20, 1988, Ser. No. 208,962

Int. Cl.[5] E04D *13/18*

U.S. Cl. 126—431 **11 Claims**



1. A compound planar matrix providing solar collector roofs and walls comprising a chambered grid member having an anterior half-matrix forming the first external surface and first internal surface of said compound matrix with respect to incoming radiation, and an opposed posterior half-matrix arranged in mirror-image relation and forming the last internal surface and last external surface of said compound matrix with respect to incoming radiation,

said anterior half-matrix and said posterior half-matrix each consisting of two identical frame members arranged in stacked relation,

each said frame member having identical frame elements arranged in intersecting relation to form grid intersections defining grid compartments surrounded by said intersecting frame elements,

each said identical frame element consisting of a flat portion having inclined webs extending outwardly away from the opposing ends of the flat portion and each inclined web having a second flat portion forming a flange parallel to the first said flat portion and extending further outwardly and all inclined webs having the same angle of inclination,

the two said identical frame members of each said half-matrix being stacked having said inclined portions of each frame element engage to thereby restrain apart the said flanges, and forming a fixed space between the said stacked flanges extending about the periphery of each said grid compartment,

each said grid compartment having a non-opaque planar body placed therein having its peripheral edges restrained and cushioned in the said fixed space formed by the said stacked flanges,

the said anterior and posterior half-matrices being arranged in paired and opposed mirror-image relation to form the said compound matrix having a neutral plane of symmetry and having said flanges form parts of the said opposed external surfaces of said compound matrix and said flat portions fastened to each other at said grid intersections by compressive devices having a thermal non-conductor spacing device disposed between each opposed grid intersection to space apart the opposed half-matrices and forming a thermal barrier between the opposed half-matrices at the said neutral plane of symmetry, said opposed grid compartments forming cooperatively a plurality of internal hollow chambers having passages between chambers provided by said spacing devices, said passages intersecting in each chamber and extending the full length and breadth of the said compound matrix and through its terminal portions and means for entry and exit of air as a medium of heat transfer.

4,942,866

BENDING CONTROL APPARATUS FOR ENDOSCOPE

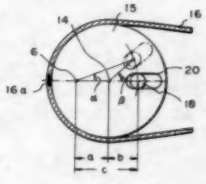
Junji Usami, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki K.K., Tokyo, Japan

Filed Feb. 17, 1989, Ser. No. 311,730

Claims priority, application Japan, Feb. 22, 1988, 63-22900[U]

Int. Cl.[5] A61B *1/00*

U.S. Cl. 128—4 **17 Claims**



1. A bending control apparatus for an endoscope comprising:

a control wire having one end portion thereof secured to a bendable portion which is bendably provided at the distal end of an insert part of the endoscope;

a pulley rotatably provided in a control part, said pulley having said control wire wound thereon;

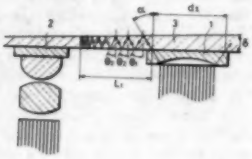
manual control means provided outside said control part so as to be rotatable about a position which is offset from the axis of rotation of said pulley by a distance a; and

rotational motion transmitting means for transmitting the rotational motion of said manual control means to said pulley at a position which satisfies the conditions of $c>a$ and $c>b$, wherein b is the distance from said transmitting means to the axis of rotation of said pulley and c is the distance from said transmitting means to the axis of rotation of said manual control means.

4,942,867
DISTAL END PART OF ENDOSCOPE

Nagashige Takahashi, and Teruo Ouchi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Jul. 7, 1989, Ser. No. 376,625
Claims priority, application Japan, Jul. 13, 1988, 63-176081; Jul. 22, 1988, 63-183955
Int. Cl.[5] A61B 1/06
U.S. Cl. 128—6 13 Claims



1. A distal end part of an endoscope which is provided at the distal end of the insert part of said endoscope, comprising:

an illuminating window through which illuminating light is emitted;

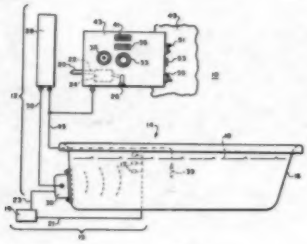
a viewing window for taking a light image into an objective optical system; and

a transparent cover continuously covering the respective surfaces of said illuminating and viewing windows, said cover being formed such that the wall thickness thereof is gradually changed at the portion thereof which extends between said illuminating and viewing windows.

4,942,868
ULTRASONIC TREATMENT OF ANIMALS

Robert E. Vago, Northbrook, Ill., assignor to Malmros Holding, Inc., Morton Grove, Ill.

Filed Mar. 30, 1988, Ser. No. 175,936
Int. Cl.[5] A61M 25/00
U.S. Cl. 128—24 A 22 Claims



1. A method of treating animals in a working fluid contained within wall means comprising the steps of:

transmitting ultrasonic vibrations at a power density in excess of 15 watts per square centimeter through the working fluid during a first time period in which no portion of the animal is immersed in said working fluid, whereby the working fluid is sterilized;

immersing a body portion of the animal into the working fluid during a second time period different than the first time period with the body portion being in acoustic contact with the working fluid; and

applying ultrasonic vibrations through the working fluid to the body portion at a frequency in a range of 15 kilohertz to 100 kilohertz and a power density below 5 watts per square centimeter during the second time period.

4,942,869
EXPANDABLE URETHRAL BOUGIE

German Borodulin, San Francisco; Alexander Shkornik, San Mateo; Maxim D. Persidsky, San Francisco, and Perinchery Narayan, San Rafael, all of Calif., assignors to Urological Instruments Research, Inc., San Francisco, Calif.

Filed Dec. 2, 1988, Ser. No. 278,826
Int. Cl.[5] A61H 1/00
U.S. Cl. 128—43 38 Claims

1. An instrument comprising

(a) a probe having a first end, a second end, and a central portion therebetween,

the probe comprising a plurality of rods, the rods being bound together at the first end of the probe, the rods being separable at the central portion of the probe, each of said rods comprising a camming surface disposed thereon,

(b) means for restricting radial movement of the rods at the second end of the probe,

(c) means for separating the rods at the central portion, said means for separating comprising

movable cams, said cams being disposed adjacent and between the rods, the cams having camming surfaces,

an actuator for moving the cams axially with respect to the rods, and

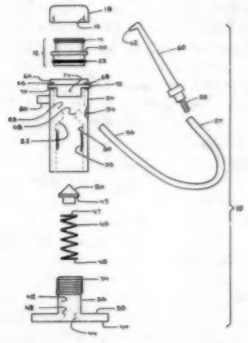
means for connecting the actuator to the cams, the cams being movable by the actuator to bring the camming surfaces of the cams together with the camming surfaces of the rods, thereby separating the rods at the central portion of the probe, and

(d) means for locking the rods in an unseparated position.

4,942,870
DENTAL HYGIENE DEVICE

George Damien, 3631 U.S. 19 N., Palm Harbor, Fla. 34684

Filed Aug. 29, 1988, Ser. No. 238,013
Int. Cl.[5] A61H 9/00
U.S. Cl. 128—66 14 Claims



1. A dental hygiene device that directs water from a faucet onto dental surfaces, comprising:

a hand-held wand member;

a water-emitting nozzle means formed in said wand member;

a fluidic device having a water-receiving first end and a water-discharging second end;

an over-pressure relief valve means for opening said second end when water pressure inside said fluidic device is above a predetermined threshold pressure;

a bore means formed in said fluidic device between its first end and its second end;

an elongate, flexible conduit means that provides fluid communication between said fluidic device and said wand member;

an adapter means having a first end substantially permanently secured to a discharge spout of a faucet and a second end releasably secured to said fluidic device;

a quick release means, having an equilibrium state and a non-equilibrium state, that releases said first end of said fluidic device from said adapter means quickly when in its non-equilibrium state and which securely retains said fluidic device to said adapter means when in its equilibrium state; and

said quick release means being a generally "U"-shaped retaining clip member having a pair of transversely spaced apart, flexible arm members, and wherein each arm member has an obtuse angle bend formed therein.

4,942,871

FLOATABLE BUBBLE BATH ASSEMBLY

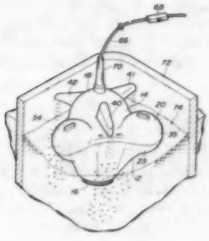
Zenzaburo Hara, Tokyo, Japan, assignor to Hara Health Industrial Co., Ltd., Japan

Continuation of Ser. No. 249,862, Sep. 27, 1988, abandoned. This application Dec. 22, 1989, Ser. No. 456,039

Claims priority, application Japan, Sep. 29, 1987, 62-246936

Int. Cl.[5] A61H *9/00*

U.S. Cl. 128—66 **7 Claims**



1. In a bubble bath assembly for creating a bubbling effect in water in a bathtub, the bubble bath assembly including: a housing having an inlet and an outlet; pump means, encased within the housing, for drawing water into the housing through the inlet and for discharging water under pressure from the outlet; and water-jetting means, communicatively connected to the outlet of the housing, for discharging water in a jet therefrom, the improvement wherein the housing comprises float means for floating the bubble bath assembly on bath water in such a manner that the water-jetting means is held over the bath water and the inlet of the housing is held under the bath water, and wherein the water-jetting means has an outlet port which directly confronts the bath water when the assembly floats on the bath water, so that water to be discharged from the water-jetting means is directed to the surface of the bath water.

4,942,872

EXTERNAL FASTENER FOR BONES AND JOINTS

Robert Jawish, 146 rue Lourmel, Paris, 75015, France

PCT No. PCT/FR85/00280, § 371 Date Jul. 7, 1986, § 102(e) Date Jul. 7, 1986, PCT Pub. No. WO86/02821, PCT Pub. Date May 22, 1986

PCT Filed Oct. 7, 1985, Ser. No. 889,934

Claims priority, application France, Nov. 15, 1984, 84 17415

Int. Cl.[5] A61B *17/60*; **F16C** *11/00*

U.S. Cl. 606—57 **35 Claims**

1. A device adapted to be used externally for fixing bones and joints of a patient, comprising:

(a) a plurality of cylindrical sleeves, each comprising a cylindrical wall provided with holes for receiving a bone-anchoring member therethrough, and each including a front extremity and a rear extremity, said sleeves being releasably connectable to one another in succession by connecting said rear extremity of a first one of said sleeves with said front extremity of a second one of said sleeves in order to form a tubular tutor; and

(b) a plurality of hollow cylindrical members, one houseable in each of said sleeves, each comprising a cylindrical wall provided with holes for receiving a bone-anchoring member therethrough.

4,942,873

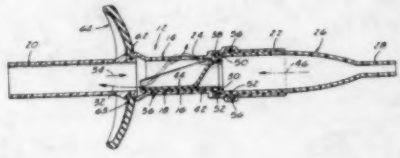
RESUSCITATION DEVICE

Lawrence F. Irwin, 12860 San Fernando Rd., Sylmar, Calif. 91342, and Frank R. Irwin, P.O. Box 636, Oceano, Calif. 93445

Continuation-in-part of Ser. No. 938,419, Dec. 5, 1986, abandoned. This application Sep. 16, 1988, Ser. No. 245,561

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—203.11 **7 Claims**



1. A mouth-to-mouth resuscitating device comprising:

(a) an elongated, first tubular member having a first, open, end portion for engagement with a victim's mouth, a second open, end portion and an elongated, annular-shaped wall extending therebetween having a cylindrically-shaped section, defining longitudinally-extending, first and second, oppositely-disposed inner, concave surfaces, said wall having an aperture through said second, inner, concave surface defining edge portions;

(b) a second tubular member having a first, open, end portion for engagement with a rescuer's mouth and a second, open, end portion;

(c) interconnection means for releasably interconnecting said first and second tubular members in coaxial alignment proximate the second end portions thereof; and

(d) valving means mounted within said first tubular member and disposed intermediate said first and second end por-

tions thereof for permitting the flow of fluids through said first tubular member in a first direction, but blocking the flow of fluids through the valving means in the opposite, second, direction while urging fluid flow through the aperture in said wall of said first tubular member, said valving means comprising an integrally formed member including:

(i) a ring-shaped portion;

(ii) a yieldably, deformable wall, including an annular portion having opposite ends and coaxially connected at one end to said ring-shaped portion and extending outwardly from said ring-shaped portion toward said first portion of said first tubular member at the other end, a first, longitudinally extending portion having a concave, inner surface and a convex, outer surface normally disposed in parallel, nesting engagement with said longitudinally-extending, first, concave inner surface of said annular-shaped wall of said first tubular member and a second, longitudinally-extending portion having a convex, outer surface and a concave, inner surface substantially coextensive with and normally, its first position, disposed in parallel, nesting engagement with said concave, inner surface of said first portion of said yieldably deformable wall, said second portion of said wall yieldably deforming towards said second, concave, inner surface of said annular-shaped wall of said first tubular member and sealably engaging with the edges of said aperture in response to fluid flow in the first direction, its second position, thereby positively blocking the flow of air through said aperture yet permitting the flow of fluids through said first tubular member in said first direction; and

(iii) means for sealably connecting said annular portion of said yieldably deformable wall with said ring-shaped portion to provide a fluid-tight seal therebetween.

4,942,874

STEAM INHALER

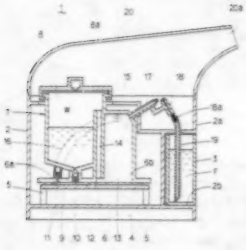
Takao Terada, Higashiosaka, and Toshiyuki Kobayashi, Kameoka, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jan. 26, 1989, Ser. No. 301,772

Claims priority, application Japan, Jan. 28, 1988, 63-9892[U]

Int. Cl.[5] A61M *11/00, 16/16, 16/18*

U.S. Cl. 128—203.16 **9 Claims**



1. A steam inhaler, comprising:

a water supply tank accommodating water therein;

a first heating chamber of a relatively small capacity and at least partly located lower than a minimum water surface level of said water supply tank;

a first conduit for conducting water from said water supply tank to said first heating chamber;

a one-way valve provided in said first conduit to prevent the flow of water from said first heating chamber to said water supply tank;

a second heating chamber of a relatively large capacity;

a heating means for heating said first heating chamber and said second heating chamber;

a second conduit for communicating said first heating chamber with said second heating chamber;

a steam nozzle for discharging the steam produced in the second heating chamber; and

a pressure control passage communicating said second heating chamber with an upper part of said water supply tank.

4,942,875

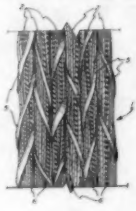
SURGICAL REPAIR DEVICE HAVING ABSORBABLE AND NONABSORBABLE COMPONENTS

Robert A. Hlavacek, New Haven; Barry L. Dumican, and Edward J. McCusker, both of Fairfield, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 835,493, Mar. 3, 1986, Pat. No. 4,792,336. This application Jan. 21, 1988, Ser. No. 146,510

Int. Cl.[5] A61L *17/00*

U.S. Cl. 606—230 **7 Claims**



1. A knitted or woven surgical repair device having a length to width ratio of greater than one, the device having an absorbable component consisting essentially of a first plurality of fibers, each fiber of the first plurality of fibers prepared from a polymer having a glycolic or lactic acid ester linkage, and a nonabsorbable component consisting of a second plurality of fibers, each fiber of the second plurality of fibers prepared from poly(butylene terephthalate) or a polyether-ester block copolymer, and the device comprising about ten percent of the first plurality of fibers and about ninety percent of the second plurality of fibers, the majority of said first and of said second plurality of fibers being essentially in the lengthwise direction of said device.

4,942,876

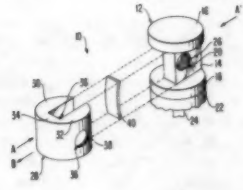
PACEMAKER TERMINAL APPARATUS

Gerhard R. Gotthardt, Castle Hill, Australia, assignor to Telectronics, N.V., Curacao, Netherlands Antilles

Filed Aug. 2, 1988, Ser. No. 227,546

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 P **18 Claims**



1. A pacemaker terminal for connecting an electrode lead having a proximal end to a pacemaker, comprising:

a first section having a first transverse hole;

a second section having a second transverse hole, said second section being moveably engageable with said first

section for aligning said first transverse hole with said second transverse hole to receive the proximal end of the electrode lead; and

means for springingly displacing said second section from said first section so as to move said first and said second transverse holes out of alignment and securely capture the proximal end of the electrode lead therein, said displacing means comprising a canted metallic spring interposed between said first and second sections.

4,942,877

DEVICE FOR MEASURING OXYGEN SATURATION DEGREE IN ARTERIAL BLOOD

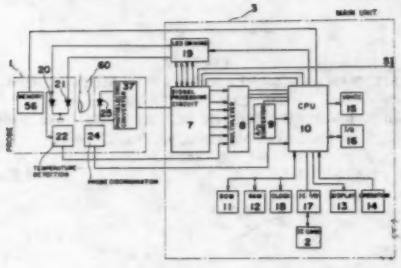
Takao Sakai, Habikino, and Kenji Hamaguri, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 4, 1987, Ser. No. 94,439

Claims priority, application Japan, Sep. 5, 1986, 61-209224

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—633 **28 Claims**



1. An oximeter device for measuring the saturation degree of oxygen in arterial blood, comprising:

a probe having light emitting means for emitting light to an organism to be measured; light receiving means for receiving light from the organism and memory means for storing data necessary for a calculation of a saturation degree of oxygen in arterial blood of an examined organism caused by said light emitting means and said light receiving means, the memory means including a storage of data representative of crosstalk of light received by the light receiving means;

a main unit having a calculation means which reads out the data stored in said memory means and calculates the saturation degree of oxygen on the basis of the read out data nd the output of said light receiving means, and

means for connecting said probe to said main unit.

4,942,878

LOCALIZATION METHOD AND DEVICE FOR DETERMINING THE DEGREE OF FRAGMENTATION OF STONES

Jacques Dory, 91, rue des Molveaux, 77450 Coupvray, France

PCT No. PCT/FR86/00335, § 371 Date May 27, 1987, § 102(e) Date May 27, 1987, PCT Pub. No. WO87/01927, PCT Pub. Date Apr. 9, 1987

Continuation-in-part of Ser. No. 37,369, Apr. 13, 1987, abandoned, which is a division of Ser. No. 728,905, Apr. 30, 1985, Pat. No. 4,658,828. This PCT application Sep. 29, 1986, Ser. No. 63,570

Claims priority, application France, Sep. 27, 1985, 85 14330

Int. Cl.[5] A61B *17/22*

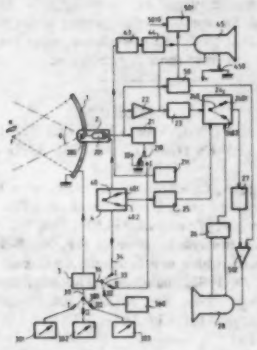
U.S. Cl. 128—660.03 **11 Claims**

1. A method for non invasive fragmentation of a concretion within a region of the body of a patient, comprising the steps of:

(a) generating, during short pulse periods, an elastic wave beam focused upon said concretion and having a predetermined high power adapted for disintegrating the concretion into fragments;

(b) radiating a pulsed acoustical signal beam and sweeping the signal beam across said region;

(c) detecting echoes of the acoustical signal reflected in said region and forming real time images of said region by displaying said echoes;



(d) stopping the generation of said elastic waves and subjecting said fragments to further pulsed and focused elastic waves emitted with a power which is substantially lower than said predetermined high power and sufficient for agitating the fragments, and

(e) radiating a further pulsed acoustic signal beam directed on the agitated fragments, detecting echoes of said further acoustic signal beam reflected by said fragments and deriving from said echoes information relative to the size of said fragments.

4,942,879

MERCURY SPHYGMOMANOMETER

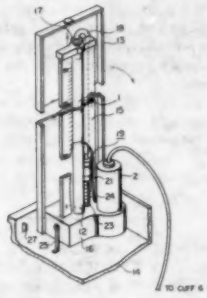
Tsuchiyasu Yokozuka, Fujioka, Japan, assignor to Yamasu Co., Ltd., Saitama, Japan

Filed Jan. 4, 1989, Ser. No. 293,408

Claims priority, application Japan, Mar. 22, 1988, 63-65696

Int. Cl.[5] A61B *5/023*

U.S. Cl. 128—684 **3 Claims**



1. A mercury sphygmomanometer having a mercury passage in which a mercury column rises and falls according to the level of pressure, a mercury reservoir connected to said mercury passage, a calibration plate for reading the top of the mercury column in said mercury passage, a bulb and a cuff

which are connected to said mercury reservoir through a tube, and a valve for opening and closing a communicating tube provided in between said mercury passage and said mercury reservoir in response to an operation of housing said constituent elements in a casing, wherein the improvement comprises:

an air pump connected to the top of said mercury passage through a tube; and

a lever means for opening and closing said valve provided on said communicating tube, said air pump and said lever means being activated in harmony with each other in response to an operation of opening and closing a cover and such that said valve is closed after the mercury is evacuated into said mercury reservoir.

4,942,880

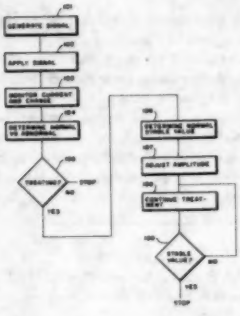
METHOD FOR NON-INVASIVE ELECTRIC DIAGNOSIS AND THERAPY IN HEMODIALYSIS AND GENERAL MEDICINE

Petr Slovák, Praha, Czechoslovakia, assignor to Ceske vysoke uceni technicke v Praze, Praha, Czechoslovakia

Continuation-in-part of Ser. No. 834,917, Feb. 28, 1986, Pat. No. 4,790,319, which is a continuation of Ser. No. 549,487, Nov. 4, 1983, abandoned, which is a continuation-in-part of Ser. No. 343,696, Jan. 28, 1982, abandoned. This application Jun. 24, 1988, Ser. No. 211,304

Int. Cl.[5] A61B *5/05*

U.S. Cl. 128—734 **2 Claims**



1. A method of simultaneous diagnosis and treatment of abnormal tissue comprising the steps of

generating an electric signal composed of electrical pulses in the range of 250 Hz to 5 KHz;

applying said electric signal to a patient through two electrodes attached to points on the surface of the patient's body, one point being the treated point;

monitoring the average value of current passing through the patient's body;

monitoring the rate of change in the average value of the current passing through the patient's body;

determining whether the treated point represents normal tissue or abnormal tissue, based on the rate of change in the average value of the current passing through the patient's body.

4,942,881

IV NEEDLE HOLDER

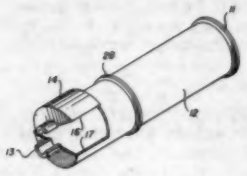
Habib Al-Sioufi, P.O. Box 654, Brookline, Mass. 02146, and Antoine J. Koudsi, 52 Blueberry Cir., Pelham, N.H. 03076

Filed Apr. 26, 1988, Ser. No. 186,432

Int. Cl.[5] A61B *19/00*

U.S. Cl. 128—763 **10 Claims**

1. A blood collection needle holder comprising an elongated tube, open at one end for receiving therein and holding a blood collection container, the other end of said tube terminating in locking means for releasably holding a blood collection needle in communication with said collection container, said locking means comprising a collar longitudinally divided into two sections separated by a longitudinal division and disposed at the end of said tube for engaging and holding a portion of said



blood collection needle when the respective sections of the collar are closed together and for releasing said blood collection needle when said sections are separated, said longitudinal division between said two sections extending to the terminus of said other end to enable removal of said needle from said other end.

4,942,882

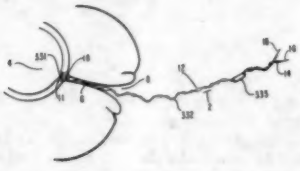
METHOD AND APPARATUS FOR MONITORING DESCENT OF FETUS

Susan Bellinson, 99 A Schofeld St., City Island, N.Y. 10464

Filed Mar. 31, 1988, Ser. No. 175,965

Int. Cl.[5] A61B *5/10*

U.S. Cl. 128—775 **5 Claims**



1. An apparatus for use as a fetal heartbeat monitor probe in a birth canal said probe having a babyward portion and an outward portion, said probe comprising:

a probe head, at the babyward portion of the probe, said probe head having a babyward end, the babyward end of said probe head having wire attachment means for attaching the probe head to a fetus;

thin flexible wire conductor means for connecting to the probe head through the birth canal, a babyward part of which conductor means is connected to the probe head, an outward part of which comprises the outward portion of the probe;

said conductor means including calibration means for measuring distance from the babyward end of the probe and monitoring the location of the fetus in the birth canal.

4,942,883

DRUG DELIVERY DEVICE

Martin H. Newman, 77 Norwood St., Sharon, Mass. 02067

Filed Sep. 29, 1987, Ser. No. 102,540

Int. Cl.[5] A61N *1/30*

U.S. Cl. 128—798 **5 Claims**

1. A self-contained transdermal medication delivery system for delivering a pre-specified medication to a body location comprising

a housing containing at least

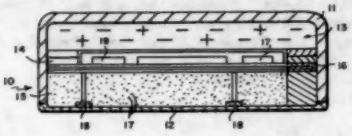
a source of electrical current pulses;

microprocessor control means for automatically providing said current pulses in accordance with a fixed, pre-

determined program established in said microprocessor control means prior to manufacture of said system for controlling the level of said current pulses and the time period over which said pulses are to be provided;

means for retaining said pre-specified medication, being electrically charged, for placement at a body location for forming with said body location an electrical current path responsive to said current pulses to cause said medication to be delivered transdermally from said medication retaining means to said body location;

said microprocessor means thereby permitting a predetermined dosage of said pre-specified medication to be delivered automatically at a predetermined rate to said body location in accordance with said fixed, predetermined



program wherein said medication retaining means is formed separately from said housing and includes a hydrophilic membrane having molecules of a medication distributed therein, and further including

electrode means for coupling to said separately formed medication retaining means;

cable means for interconnecting said electrode means and said source of current pulses,

one or more separately formed cartridges containing medication in liquid form, each cartridge being inserted into said housing means for attachment to said cable means, said cable means including a channel for transporting said liquid medication to the membrane of said medication retaining means for distribution of said medication therein.

4,942,884

PORTABLE BATTERY POWERED ELECTROMAGNETIC THERAPY APPLICATION

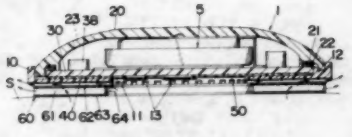
Tsutomu Ichinomiya; Tomohiro Kami, both of Hikone; Fumio Kitagawa, Neyagawa; Sumio Wada, Hikone; Hideaki Abe, Moriguchi; Youichi Ise, Hirakata, and Toshio Kusunoki, Hikone, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Division of Ser. No. 178,583, Apr. 7, 1988. This application Jun. 8, 1989, Ser. No. 362,936

Claims priority, application Japan, Jun. 15, 1987, 62-148534

Int. Cl.[5] A61N *1/40*

U.S. Cl. 128—804 **14 Claims**



1. A portable battery powered diathermy therapy applicator adapted for use on the skin of a patient for applying a high frequency electromagnetic field to a living tissue comprising:

an oscillator for producing the high frequency electromagnetic field;

an antenna connected to and energized by said oscillator to transmit the electromagnetic field to the living tissue;

a battery connected to and driving the oscillator; and

a substrate mounting thereon said antenna, said battery and electrical components forming the circuit of said oscillator;

a flat casing accommodating therein said substrate carrying said antenna, said battery and said electrical components, and support means for attaching said casing onto the skin of the user;

said flat casing being circular in planar configuration and having a top with a rounded periphery.

4,942,885

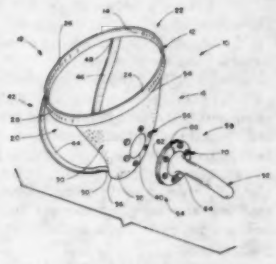
ARTICLE OF CLOTHING FOR USE AS A CONDOM

Anton Davis, 108-33, 171st Pl., Jamaica, N.Y. 11433; Kelvin A. Simmons, 15 Oakley Ave., Massapequa, N.Y. 11758, and Richard Blair, 819 Hegeman Ave., Brooklyn, N.Y. 11207

Filed Apr. 5, 1989, Ser. No. 333,241

Int. Cl.[5] A61F *13/00*

U.S. Cl. 128—842 **1 Claim**



1. An article of clothing for preventing transmission of sexually-related diseases comprising:

(A) a monolithic body portion which includes

(1) a waist-encircling band having an anterosuperior portion, a posterosuperior portion and an anteroposterior portion when worn by a user,

(2) a codpiece-like element including

(a) a superior portion pendently attached to said waist-encircling band anterosuperior portion,

(b) an inferior portion,

(c) said codpiece-like element being sized and shaped to cover essentially the entire pubic area of a user and to have said inferior portion thereof located between the user's leges when worn and having an opening positioned therein to receive a user's penis therethrough,

(3) two buttocks encircling straps each attached at one end to said band posterosuperior portion and at the other end to said codpiece-like element inferior portion to extend posterioranteriorly between the user's legs when worn; and

(B) condom-attaching means which includes

(1) a flexible plastic annular mounting plate assembly sized to surround said codpiece-like element opening,

(2) mounting plate fastener means on said codpiece-like element, said mounting plate fastener means including a plurality of angularly spaced apart snaps located circumjacent to said codpiece-like element opening,

(3) fastener receiving means on said mounting plate assembly for co-operating with said mounting plate fastener means to releasably secure said mounting plate assembly to said codpiece-like element, said fastener receiving means including a plurality of angularly spaced apart snap receiving elements,

(4) condom mounting means on said mounting plate assembly for mounting a condom on said mounting plate assembly in a position to cover said codpiece-like element opening, said condom attaching means mounting plate assembly including two concentric annular plate elements,

(5) one annular plate element of said two concentric annu-

lar plate elements including a plurality of openings defined therethrough,

(6) mounting plate coupling means for releasably coupling said two concentric annular plate elements together, said mounting plate coupling means being positioned adjacent to said snap fasteners on said codpiece-like element, and including

(a) a plurality of projecting snap fastener-receiving elements mounted on the other condom mounting means annular plate element in position to be received through said angularly spaced apart openings in said one annular plate element,

(b) each projecting snap fastener-receiving element including

(1) an elongated body,

(2) a base located at a proximal end of said body and which is fixedly mounted on the other annular plate element,

(3) said elongated body extending through said other annular plate element,

(4) a groove defined in said elongated body, and

(5) a blind-ended bore defined in a distal end of said elongated body, said blind-ended bore being sized and shaped to snappingly receive one of said angularly spaced apart snaps mounted on said codpiece-like element to releasably couple said other annular plate element to said codpiece-like element with said one annular plate element trapped between said codpiece-like element and said other annular plate element,

(c) a projection mounted on said one annular plate element to extend into each of said angularly spaced apart openings, each of said projections being flexible and sized to engage into a groove of a snap fastener-receiving element to snappingly lock said body to said one annular plate element,

(d) a plurality of dimple-like projections on said other annular plate element, and

(e) a plurality of dimple-like depressions defined in said one annular plate element in position to receive a one dimple-like projection in each dimple-like depression and capture a condom between said dimple-like projection and said one annular plate element.

4,942,886

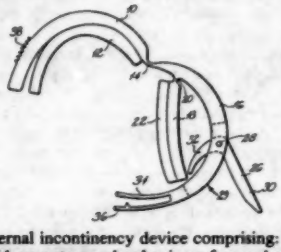
EXTERNAL INCONTINENCY DEVICE

John W. Timmons, 5300 Ocean Blvd., #504, Sarasota, Fla. 34242

Filed Feb. 22, 1989, Ser. No. 313,988

Int. Cl.[5] A61B *17/00*

U.S. Cl. 128—885 **10 Claims**



1. An external incontinency device comprising:

a first rigid, arcuate member having a free end and a hinged end;

said first arcuate member having a padded inner surface;

a second rigid, arcuate member having a free end and a hinged end, hingedly connected to said hinged end of said first rigid, arcuate member;

compression means including a free end and a hinged end hingedly connected adjacent to said hinged end of said first arcuate member;

said compression means extending across said device to a point in proximity to said free end of said first arcuate member and including a rigid member having a padded upper surface; engaging means secured to said second rigid member for engaging said compression means to move said compression means to a compressing position and for disengaging said compression means to release said compression means from said compression position;

releaseable securing means at said free ends of said first and second arcuate members for holding said free end of said first arcuate member and said free end of said second arcuate member in a desired spaced relationship.

4,942,887

FILTER MOUTHPIECE FOR A SMOKING ARTICLE

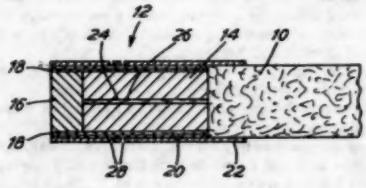
Ahmed Abdelgawad, Colombier; Daniel Braem, Doffrane, and Urs Nyffeler, Corcelles, all of Switzerland, assignors to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland

Filed Jun. 9, 1988, Ser. No. 204,546

Claims priority, application United Kingdom, Jun. 15, 1987, 8713904

Int. Cl.[5] A24D *3/04*

U.S. Cl. 131—336 **15 Claims**



1. A filter mouthpiece for a smoking article, said filter mouthpiece comprising: a filter, said filter having a peripheral surface and two opposed end surfaces, said end surfaces being permeable to smoke and air and said peripheral surface being rendered generally impermeable to the smoke and air, one of said end surfaces being a tobacco rod end which, when the mouthpiece forms part of a smoking article, abuts a rod of tobacco, and the other of said end surfaces being a mouth end, which, in use, is held in a smoker's mouth; a tube open at both ends, the wall of said tube being substantially impermeable, said tube extending axially through said filter from said tobacco rod end thereof toward but ending short of said mouth end thereof, side wall of said tube having holes through it for the passage of smoke between said tube and said filter, said peripheral surface of the filter mouthpiece being air transmissive over at least one discrete area to admit air into said filter.

4,942,888

CIGARETTE

Maria T. Montoya, High Point; Alan B. Norman, Clemmons; Norman C. Sanders, Jr., Winston-Salem, and Glenn E. Creamer, Pfafftown, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Jan. 18, 1989, Ser. No. 298,539

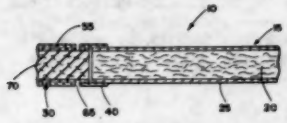
Int. Cl.[5] A24D *1/02*; A04D *1/18*

U.S. Cl. 131—359 **12 Claims**

1. A cigarette having smokable material contained in a circumscribing outer wrapping material, the cigarette having:

(a) smokable filler material comprising: (i) from about 10 to about 90 weight percent tobacco filler material, and (ii) about 10 to about 90 weight percent of a second smokable material having from about 0 to up to about 90 weight percent inorganic material, from about 10 to about 95 weight percent carbonaceous material which includes pyrolyzed alpha-cellulose, and up to about 15 weight percent binding agent; the amount of carbonaceous material within the blend of smokable material being about 9

percent or more, based on the total weight of the blend; and



(b) wrapping material circumscribing the smokable filler and having an air permeability of less than about 10 CORESTA units.

4,942,889

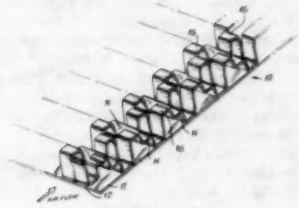
EXPANDED WEB OF SHEET MATERIAL AND METHOD OF MAKING SAME

Everett C. Grollimund, Midlothian, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 613,159, May 23, 1989, Pat. No. 4,585,016. This application Feb. 6, 1986, Ser. No. 826,618

Int. Cl.[5] A24D *1/02*

U.S. Cl. 131—365 **19 Claims**



1. A method of making an expanded composite web, comprising:

a. providing a first web of formable sheet material;

b. shearing and forming the first web in a plurality of rows across its width to form convolutions extending longitudinally along the web, each convolution extending above and below the original plane of the web in a generally sinusoidal configuration and joined to the next convolution by a web portion lying substantially in the original plane of the web; and

c. laminating a surface of the sheared and formed first web to a surface of a second web of sheet material.

4,942,890

CONTAINER FOR SCALP PRODUCTS AND BASE THEREFOR

Paulo R. J. Newlands, Rua Fadel Fadel 112/103, Gávea, Rio de Janeiro 22430, Brazil

Filed Oct. 12, 1988, Ser. No. 256,572

Int. Cl.[5] A45D *7/02*

U.S. Cl. 132—212 **13 Claims**

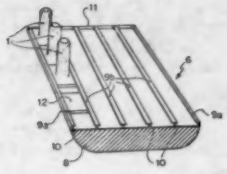
1. A container for a hand-held applicator for applying products to the scalp or other portions of the body,

said container being small enough to permit a plurality of such containers to be mounted beside each other on a support base of the hand-held applicator so that a plurality of containers simultaneously apply their contents to the body,

a hollow elongated reservoir portion having a base end and an application end opposite each other;

a housing inside said reservoir portion near said application end;

a rotatable body mounted in said housing for free rotation,



means for fitting said container individually on said support base, said means including a flange portion for removably mounting said container to said support base.

4,942,891

EYEBROW-COVER ELEMENT

Sandra Trevisan, Via F. Filzi 5, 36050 Quinto Vicentino (Prov. of Vicenza), Italy

Filed Feb. 5, 1988, Ser. No. 152,505

Claims priority, application Italy, Feb. 10, 1987, 63221/87[U]

Int. Cl.[5] A45O *40/30*

U.S. Cl. 132—216 **4 Claims**

1. An eyebrow-cover element comprising,

at least one body defining a substantially elongate arcuate configuration, said body having at least one side and at least one other side,

at least one concavity defined at said one side of said body,

at least one inner surface defined by said concavity,

a perimetral edge defined by said inner surface,

adhesion means, said adhesion means being at least temporarily associable with at least one of said inner surfaces of said concavity and said perimetral edge of said inner surface, for at least temporarily attaching said body to an eyebrow,

at least one containment zone defined by said concavity and being adapted for at least partially accommodating an eyebrow and said adhesion means,

ornaments defined on said other side of said body, wherein said ornaments comprise ornamental motifs.

4,942,892

HAIR-CURLING DEVICE

Jill M. Hill, 264 Lowena Dr., Long Beach, Calif. 90803

Continuation of Ser. No. 161,544, Feb. 29, 1988, abandoned. This application Feb. 28, 1989, Ser. No. 317,096

Int. Cl.[5] A45D *2/20*

U.S. Cl. 132—247 **9 Claims**

1. A hair curler for use in creating Z-shaped, angular or squared curls in the hair comprising:

an elongated substantially flat main body portion;

a first end flap hinged by a thin narrow folding hinge to a first end of the main body;

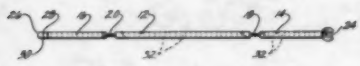
a second end flap hinged by a thin narrow folding hinge to a second end of the main body;

an elongated locking receptacle of generally C-shaped con-

figuration facing outwardly and extending along a free end of the first end flap; and

an elongated locking member extending along a free end of the second flap and shaped to match the contour of the locking receptacle for forming a frictional interlocking fit with the receptacle under compression;

the first and second end flaps together having a length at least that of the main body when folded back about their



respective hinges to overlie the same side of the main body, the locking member and receptacle being interlocked fictionally by compression in a snap fit when the locking member and receptacle are aligned and the end flaps then pressed downwardly toward the main body to thereby fictionally snap the locking member into engagement with the receptacle and thereby hold the device wrapped around hair in the space between the interlocked end flaps and the main body of the hair-curling device.

4,942,893

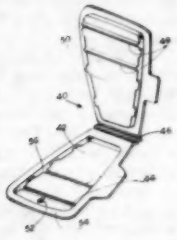
HAIR HIGHLIGHTING CAPSULE

Allan J. Trottier, 1121 Woodvale Dr., Gallatin, Tenn. 37066

Filed Aug. 3, 1988, Ser. No. 227,555

Int. Cl.[5] A45D *19/18*

U.S. Cl. 132—270 **10 Claims**



1. A hair highlighting capsule comprising:

a female side formed of a sheet of material, said sheet of material being embossed with a central cavity bounded by a cavity sidewall, said central cavity and cavity sidewall being bounded on three sides by two side lips and an end lip;

a male side formed of a sheet of material, said sheet of material being embossed with a projection bounded by a projection sidewall, said projection and projection sidewall being bounded on three sides by two side lips and an end lip, said projection of said male side being so configured to mate with said central cavity of said female side;

a hinge joining said male side and said female side, said hinge positioned such that said projection and said central cavity will register when said capsule is closed; and means being provided to the male side and to the female side for locking said projection into said cavity.

4,942,894

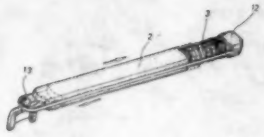
MULTI PURPOSE CARTRIDGE TYPE HANDLE ASSEMBLY AND TOOLS

Ming-Der Lai, No. 53-2, Lane 239, Pa Der 3rd Road, Pan Chiau City, Taipei Hsien, Taiwan

Filed Nov. 28, 1989, Ser. No. 441,981

Int. Cl.[5] A61C *15/00*; A61B *17/00*

U.S. Cl. 132—323 **2 Claims**



1. A multi-purpose cartridge type handle assembly, including a handle body and sanitary tool adaptor means; the handle body being composed of a body frame, a movable block wedged in the body frame, and a spring fixed between a handle head of the body frame and said movable block; the handle body being able to be assembled and disassembled with ease; sanitary tools including a tooth brush for cleaning the crevice between teeth; a tooth string, and a brush head of common tooth brush, and an operation knife; the body frame comprising said handle head and a U-shaped bracket with both ends fixed to said handle head, said handle head having one round tenon; said movable block being solid and rectangular and having a round tenon on one end and a tongue with a concave bow-shaped edge on the other end; said movable block also having a long concave slot on both sides, of which the width is closely matched with the thickness of the U-shaped bracket, but permitting the movable block to slide along the bracket; the spring having one end fitted over the round tenon of said handle head and the other end fitted over the round tenon of said movable block.

4,942,895

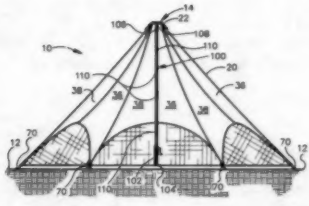
TENSIONED TENT STRUCTURE AND ERECTION METHOD THEREFOR

James P. Lynch, 13 S. Field, Lakewood, Colo. 80226

Filed Nov. 9, 1988, Ser. No. 268,852

Int. Cl.[5] E04H *15/00*

U.S. Cl. 135—99 **30 Claims**



1. A tent structure adapted to be erected on a support surface to provide a sheltered space, comprising:

a flexible covering including a vertex portion and a plurality of corner portions spaced from the vertex portion, said covering configured generally in the shape of a pyramid having a polygonal base with vertices defined by said corner positions, said covering constructed of a plurality of panel sections each having a pair of said edges converging at said vertex portion and an arcuate base edge, each panel section forming a face of said pyramid with said base edges forming a peripheral edge for said covering, adja-

cent ones of said panel sections being connected at adjacent side edges by primary attachment seams along said primary radial lines;

an anchor means for securing each corner portion to said support surface to cover a surface area thereof;

a pole assembly positionable in an right position between said support surface and said vertex portion and having an effective length which supports said covering in an erect state with said vertex portion spaced above said support surface and with said corner portions adjacent said support surface, said arcuate base edges each extending from respective corner portions adjacent said support surface to a central location above said support surface to form an archway sized to allow ingress into and egress out of said sheltered space; and

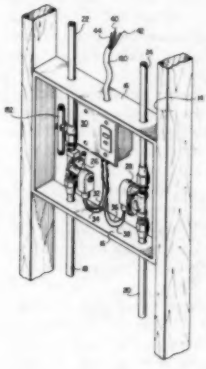
extension and contraction means for adjustably varying the effective length of said pole assembly in order to move the vertex portion further from and closer to said support surface when said assembly is in the upright position to respectively increase and decrease tension forces between the vertex portion and the corner portions when the corner portions are anchored to the support surface whereby the covering is held taut when tension is applied to the vertex portion by the pole assembly so that the ten structure is thereby erected.

4,942,896

VALVE ASSEMBLY FOR SHOWERS

J. Michael Slusser, Arlington, Tex., assignor to Production Diagnostics, Inc.

Filed Apr. 11, 1989, Ser. No. 336,260
Int. Cl.[5] F16L *5/00*
U.S. Cl. 137—360 **13 Claims**



1. A valve assembly for control of water comprising:

(a) a frame;

(b) a first inlet conduit mounted on said frame;

(c) a second inlet conduit mounted on said frame;

(d) a first outlet conduit mounted on said frame;

(e) a second outlet conduit mounted on said frame;

(f) a first solenoid valve conducting said first inlet conduit with said first outlet conduit to provide opening and closing of the first passageway formed by said conduit; and

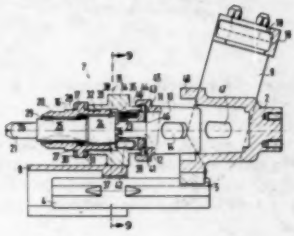
(g) a second solenoid valve connecting said second inlet conduit to said second outlet conduit to provide for opening and closing the second passageway formed by said second conduit thereby controlling flow of fluid therethrough.

4,942,897

REMOTE CONTROL AND REMOTE HANDLING ACCESSORY, ESPECIALLY FOR THE HOT ZONE OF RADIOACTIVE PLANTS

Giuseppe Radovan, Lindau; Klaus Bisseck, Ehlershausen; Lothar Hoffmeister, Hanover; Helmut Westendorf, Haste, all of Fed. Rep. of Germany; Michael J. Sandling, Prixfor, and James W. Davidson, Prixford, both of Great Britain, assignors to Xomox Limited, Devon, Great Britain, United Kingdom and Deutsche Gesellschaft Fur Wiederaufarbeitung Von Kernbrennstoffen MBH, Hanover, Fed. Rep. of Germany

Filed Jun. 9, 1986, Ser. No. 872,194
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520541
Int. Cl.[5] F16K *27/00*
U.S. Cl. 137—454.2 **8 Claims**



1. A remote control handling accessory adapted for use with a pipeline comprising:

a hollow case not subject to wear and permanently secured to said line;

a plurality of elements which are subject to wear and must from time to time be removed and replaced, said elements being connected in operative arrangement and removably secured to the case;

a hollow clamping bracket pivotally secured to the case, said bracket having a first closed position at which it at least partially encloses said elements and a second open position at which it is swung away from and exposes said elements;

said elements extending along an axis which is aligned with the bracket when it is in its first position and including a central bolt which extends along said axis and can be moved back and forth along the axis,

wherein one of the elements is a cover having a hollow thread threadedly engaged by the bolt, all elements other than the bolt and cover cooperating with the cover whereby displacement of the cover along the axis will be also displace said all other elements.

4,942,898

AUTOMATIC CULVERT DIRECTIONAL FLOW CONTROL DEVICE

Frank Osowski, R.R. #2, Box 150, Oslo, Minn. 56744

Filed Jun. 19, 1989, Ser. No. 368,024
Int. Cl.[5] F16K *15/03*
U.S. Cl. 137—454.2 **9 Claims**

6. An automatic culvert directional flow control device designed to prevent the back flow of water in a culvert comprising:

a generally arcuate supporting member sized to tightly fit at least a portion of an inside diameter of a culvert, the culvert having an inside surface, and sized to fit inside a groove on the inside surface of the culvert;

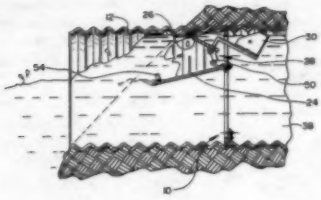
hinge means attached horizontally across the arc of said supporting means;

normally closed upper and lower semicircularly shaped dampers pivotally attached to said hinge means and being

in a vertical relationship one over the other when normally closed;

a counter balance attached to the upper damper,

whereby a first predetermined pressure of water bearing against the lower damper will open that damper allowing water to pass through, and where gravity closes said lower damper when the water pressure falls below said



first predetermined pressure, and where a second higher predetermined pressure of water bearing against both dampers will open both dampers, said second damper being opened against the weight of the counter balance means to allow additional water to pass through, where said counter balance means close said upper damper when the water pressure falls below said second predetermined pressure.

4,942,899

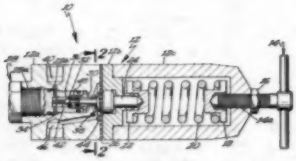
CARTRIDGE PRESSURE REGULATOR

William D. Vork, Edina, and James H. Larson, Coon Rapids, both of Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed Jul. 10, 1989, Ser. No. 377,474

Int. Cl.[5] G05D *16/08*

U.S. Cl. 137—454.5 **2 Claims**



1. A fluid pressure regulator comprising a housing having an inlet and outlet, a diaphragm, a ball, a ball retainer, a seat, a valve actuator means for biasing said diaphragm, the improvement comprising:

a cartridge member removably retained in said housing, said ball, said ball retainer and said seat being located in said cartridge member such that said cartridge member containing said ball, said ball retainer, said seat and may all be removed from said housing, as a unit;

a diaphragm chamber containing said diaphragm and said actuator, said inlet connecting to said chamber and sized so as to maintain flow velocity through said regulator as a relatively high level and directing said flow through said chamber so as to continually flush said chamber, said actuator comprising a head having a diaphragm side and a stem side, said diaphragm comprising a perimeter and said actuator stem side comprises a diametral angular rib for directing flow through said chamber to said perimeter.

4,942,900

PRESSURE CONTROL VALVE

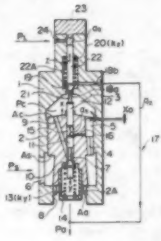
Yusaku Nozawa, Ibaraki; Kazumasa Yuasa, Tsuchiura; Wataru Ootu, and Kinya Takahashi, both of Ibaraki, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1989, Ser. No. 412,491

Claims priority, application Japan, Sep. 28, 1988, 63-243466

Int. Cl.[5] G05D *16/00*

U.S. Cl. 137—490 **7 Claims**



1. A pressure control valve comprising:

a valve case having an inlet section and an outlet section for hydraulic fluid as well as a signal port to which signal pressure is introduced;

a main valve element of seat type slidably accommodated in said valve case for controlling communication between said inlet and outlet sections by movement of said main valve element;

a control chamber defined within said valve case and between said valve case and an end face of said main valve element remote from said outlet section for biasing said main valve element in a valve closing direction;

a variable restrictor variable in its opening in response to the movement of said main valve element for communication between said control chamber and said inlet section of said valve case;

a first pilot line for communication between said control chamber and said outlet section of said valve case;

a first pilot valve element arranged in said first pilot line;

first valve drive means operative in response to pressure of said inlet section of said valve case for opening said first pilot valve element when the pressure of said inlet section reaches a first predetermined value;

a second pilot line for communication between said control chamber and said outlet section of said valve case:

a second pilot valve element arranged in said second pilot line; and

second valve drive means operative in response to differential pressure between the pressure of said inlet section of said valve case and said signal pressure introduced to said signal port for opening said second pilot valve element when said differential pressure reaches a second predetermined value.

4,942,901

FLUID CUTOFF DEVICE IN A FLUID LINE

Pietro Vescovini, Via Artigiani, 10/12, 41056 Medolla, (Modena), Italy

Filed Jun. 14, 1989, Ser. No. 366,800

Claims priority, application Italy, Jun. 15, 1988, 20977 A/88

Int. Cl.[5] F16L *37/28*

U.S. Cl. 137—614.06 **8 Claims**

1. A device for the connection, or cutoff, or sealed separation of two branches of a fluid line, comprising:

a first coupling having a central axis, a proximal end for connection to a fluid line, a generally cylindrically shaped

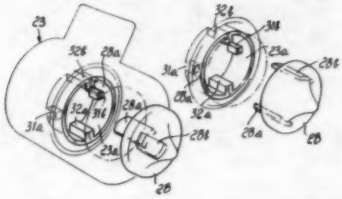
outer body, and a hollow generally cylindrically shaped inner body with a first inner sealing surface;

a first shutter valve enclosed within said first coupling and adapted to be normally biased closed to abut against the first sealing surface to cut off fluid flow through the first coupling;

a second coupling having a central axis, a proximal end for connection to a fluid line, a generally cylindrically shaped outer body adapted to sealably translate within the inner body of said first coupling, a hollow generally cylindrically shaped inner body with a second inner sealing surface;

a second shutter valve enclosed within said second coupling and adapted to be normally biased closed against the second sealing surface to cut off fluid flow through the second coupling;

a first actuation means within said first coupling engagable with said second shutter valve and adapted to separate said second shutter valve from the second sealing surface



to open said second coupling upon sufficient translational engagement of said second coupling into said first coupling;

said first coupling having a groove in the outer body thereof which has an open distal end, and which extends from the open end thereof along a first longitudinally spiralled portion to a first lateral portion which is perpendicular to the axis of the device, then further along a second longitudinally spiralled portion to a second lateral portion which is perpendicular to the axis of the device;

said second coupling having a follower pin which extends from the proximal end thereof and is adapted to slide along the groove in said first coupling, whereby the engagement of the follower pin in the first lateral portion corresponds to a spaced apart relationship of said first and second couplings so that said first and second shutter valves are closed, and the engagement of the follower pin in the second lateral portion corresponds to a maximum mutual engagement of said first and second couplings to open at least one of said shutter valves.

4,942,902

MIXING CARTRIDGE FAUCET WITH PARTS THAT CAN APPLY PRESSURE TO THE VALVE PLATES OF HARD MATERIAL

Alfons Knapp, Biberach/Riss, Fed. Rep. of Germany, assignor to Masco Corporation, Taylor, Mich.

PCT No. PCT/US88/03087, § 371 Date May 5, 1989, § 102(e) Date May 5, 1989, PCT Pub. No. WO89/02558, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 8, 1988, Ser. No. 369,561

Claims priority, application Italy, Sep. 9, 1987, 67768 A/87; Sep. 9, 1987, 67769 A/87; Sep. 9, 1987, 67770 A/87

Int. Cl.[5] F16K *11/06*

U.S. Cl. 137—625.17 **26 Claims**

1. A cartridge for a mixing valve faucet that regulates the flow rate and mixing proportions of liquid from two supply inlets to said faucet, said cartridge characterized by:

a main shell;

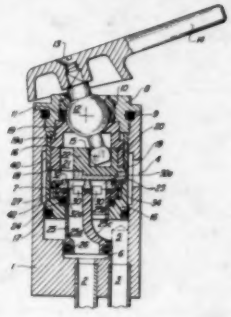
an operating mechanism mounted to said shell;

a movable valve element operably connected to said operating mechanism;

a separate seat member mounted to said shell;

said separate seat member mounting a fixed valve plate to cooperate with said movable valve element;

said separate seat member being slidably and sealably connected to the shell of the cartridge;



sealing means interposed between said shell and said separate seat member for sealing fluid from flowing therebetween;

the separate seat member being constructed such that its lower extremity extends in a part of a cavity of the body of the faucet that has a reduced area in cross-section and in which one of the supply pipes is connected.

4,942,903

FIRE AND CORROSION PROTECTED HOSE

Clas T. Jacobsen, Drammen, Norway, assignor to EB Norsk Kabel a.s, Drammen, Norway

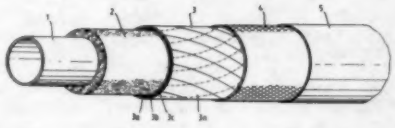
PCT No. PCT/NO88/00001, § 371 Date Sep. 8, 1988, § 102(e) Date Sep. 8, 1988, PCT Pub. No. WO88/05885, PCT Pub. Date Aug. 11, 1988

PCT Filed Jan. 5, 1988, Ser. No. 246,663

Claims priority, application Norway, Jan. 29, 1987, 870382; Mar. 25, 1987, 871253

Int. Cl.[5] F16L *35/00, 58/00*

U.S. Cl. 138—110 **17 Claims**



1. A bendable fire and corrosion protected hose for conducting corroding material, comprising:

an inner bendable polymeric plastic pipe constituting a means to provide corrosion resistance to the hose from said corroding material;

a layer of light, thermal insulating material covering said pipe and which normally cannot stand exposure to temperatures above about 800° C.; and

a fire resistant material provided around said insulating material and which forms a ceramic, stable fire protecting phase at temperatures above about 800° C.;

said insulating material and said fire resistant material permitting bending of said article.

4,942,904

HOLLOW SECTION, IN PARTICULAR A TUBE, OF LONG FIBRE REINFORCED PLASTIC

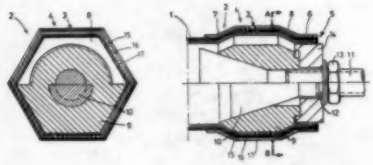
Martin Kacza, Aachen; Hartmut Rest, Langenfeld, and Eberhard Born, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,079

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1987, 3734343

Int. Cl.[5] F16L *55/12*

U.S. Cl. 138—89 7 Claims



1. Hollow section (1, 31), in particular a tube, of long fibre (15, 33) reinforced plastic, having an integrated force induction element (2,32) at least at one end thereof, the element having a jacket (3, 45) consisting of a portion of the hollow section (1,31), the jacket (3, 45) surrounding a core (9) having a tie rod (11) extending therethrough, the improvement wherein the jacket (3, 45) consists of a radial enlargement (4, 47) of the hollow section 61, 31), the enlargement extending around the periphery of the hollow section and tapering into a narrow section (6, 49) at an end (5, 48) of the hollow section (1, 31), the core (9) being in the form of an expansion element which coacts with a clamping member (10) connected to the tie rod (11), and wherein the expansion element lies in a form-fitting manner against the interior of the enlargement (4,47) over the length of said enlargement.

4,942,905

COMPOSITE HOSE CONSTRUCTION

Eiji Takemae; Masakazu Koizumi, both of Hiratsuka, and Tadashi Ishibashi, Kawaguchi, all of Japan, assignors to The Yokohama Rubber Co., Ltd. and Chiyoda Kenki Co., Ltd., both of, Japan

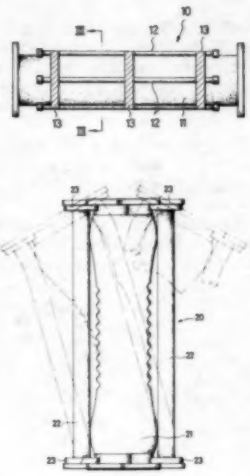
Filed Nov. 14, 1988, Ser. No. 270,326

Claims priority, application Japan, Nov. 18, 1987, 62-289632

Int. Cl.[5] F16L *11/12*

U.S. Cl. 138—118 4 Claims

1. A composite hose comprising a flexible main hose having a first diameter, and at least one subhose having a diameter smaller than said first diameter and having a layer of reinforcement, said subhose being disposed longitudinally over and secured integrally with said main hose by fastening means, said layer of reinforcement being oriented at a specified angle with respect to the longitudinal axis of said subhose to constitute a means to cause said main hose to bend in a predetermined direction upon the application of pressure to said subhose where said subhose laterally dilates and the overall length



thereof is reduced to bend said main hose in a predetermined direction.

4,942,906

RUBBER HOSE

Ichiro Igarashi, Komaki, and Kazuhiko Nishimura, Kasugai, both of Japan, assignors to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Dec. 12, 1988, Ser. No. 283,382

Claims priority, application Japan, Dec. 16, 1987, 62-319328

Int. Cl.[5] F16L *11/08*

U.S. Cl. 138—126 6 Claims

1. A rubber hose having:

an outer rubber tube and

an inner rubber tube located radially inwardly of said outer rubber tube,

said inner rubber tube comprising an inner layer and an outer layer located between said inner layer and said outer rubber tube,

a reinforcing fiber layer disposed between said outer rubber tube and said outer layer of said inner rubber tube such that said inner and outer rubber tubes and said reinforcing fiber layer constitute an integral tubular body,

said inner layer being formed of a first polymer blend of acrylic rubber and fluorine-contained resin, said acrylic rubber of said first polymer blend being a copolymer rubber produced by copolymerization of at least four monomers, said at least four monomers including at least one first monomer selected from a group consisting of

alkyl acrylate and alkyl methacrylate, at least one second monomer selected from a group consisting of substituted-alkyl esters of acrylic acid and methacrylic acid, at least one third monomer selected from a group consisting of diene; acrylate containing dihydrodicyclopentadienyl radical and methacrylate containing dihydrodicyclopentadienyl radical; ethylenically unsaturated compound containing epoxy radical; and ethylenically unsaturated compound containing active halogen, and at least one fourth monomer selected from a group consisting of other ethylenically unsaturated compound capable of copolymerizing with said at least one first monomer, said at least one second monomer and said at least one third monomer,

said outer layer being formed of a second polymer blend different from said first polymer blend, said second polymer blend containing epichlorohydrin rubber.

4,942,907

INTAKE MANIFOLD

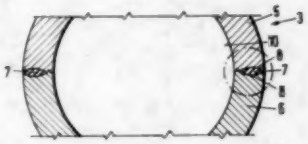
Günter Joh, Kapellenweg 14, D-6460 Gelnhausen, and Wilhelm Sedlmayr, An der Hammerhalde 15, D-7730 VS-Villingen, both of Fed. Rep. of Germany

Continuation of Ser. No. 121,266, Nov. 16, 1987, abandoned. This application Jun. 9, 1989, Ser. No. 366,198

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1986, 3639219

Int. Cl.[5] F16L *9/16*

U.S. Cl. 138—157 **12 Claims**



1. A pipe for an intake manifold for use in a combustion engine, said pipe having a curved longitudinal axis and comprising at least two complementary sections defining at least one internal space; and means for bonding said sections to each other to establish a connection between said sections, said bonding means consisting of at least one connecting element containing vulcanized elastomeric material and being interposed between said sections adjacent said internal space and a coupling agent securing the connecting element to said sections, and said bonding means constituting a means for damping sound responsive vibrations in the pipe between said sections.

4,942,908

WARP TRANSFER CONTROL SYSTEM OF LOOM FOR FILLING DENSITY CHANGE

Shuichiro Imamura, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 29, 1989, Ser. No. 329,987

Claims priority, application Japan, Mar. 29, 1988, 63-75306

Int. Cl.[5] D03D *49/04*

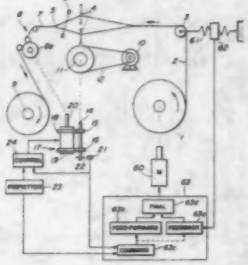
U.S. Cl. 139—99 **9 Claims**

1. A control system of a loom, comprising:

warp transfer means for transferring warp Yarns in said loom, said warp transfer means comprising warp let-off means including first drive means for varying a warp let-off means including first drive means for varying a warp let-off rate, and fabric take-up means including second drive means for changing a fabric take-up rate of said loom to change a filling density of a woven fabric,

command means for commanding changes of said filling density in accordance with a preset filling density pattern during a normal weaving operation, and

control means for controlling said warp let-off rate and said fabric take-up rate by producing a warp let-off rate control signal representing said warp let-off rate, and a fabric take-up rate control signal representing said fabric take-up rate in such a manner that, each time a change of said filling density is commanded by said command means, said



let-off control signal is changed from a current let-off signal value to an excessive let-off signal value at a first instant, said take-up control signal is changed from a current value directly to a new take-up signal value at a second instant, and said let-off control signal is further changed at a third instant from said excessive let-off signal value to a new let-off signal value which is intermediate between said current let-off signal value and said excessive let-off signal value.

4,942,909

WEFT-FEELER WITH AUTOMATIC ADJUSTMENT OF THE DELAY TIME, FOR WEFT FEEDERS OF SHUTTLELESS LOOMS

Fiorenzo Ghiardo, Vigliano Biellese, Italy, assignor to ROJ Electrotex S.p.A., Biella, Italy

Filed Dec. 28, 1988, Ser. No. 291,306

Claims priority, application Italy, Dec. 31, 1987, 23296 A/87

Int. Cl.[5] D03D *51/34*

U.S. Cl. 139—370.2 **4 Claims**

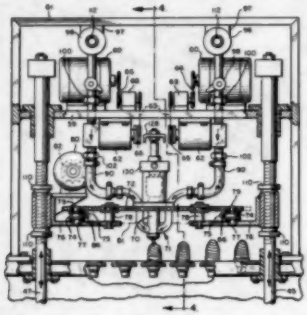
1. A device for detecting weft yarn breakage, said device being adapted to be positioned upstream of a weft yarn feeding and storage device in a shuttleless loom, said device comprising means for detecting weft yarn breakage during operation of a motor of the weft yarn feeding and storage device of the shuttleless loom, and means generating a loom-stoppage signal responsive to detection of a said weft yarn breakage, after a predetermined delay time T has elapsed from detection of a said breakage, wherein said signal-generating means comprises an electronic circuit including means for receiving information indicative of the speed of said motor of said weft yarn feeding and storage device, said electronic circuit automatically adjusting said delay time T in relation to said information indicative of the speed of said motor.

4,942,910

PROCESS AND APPARATUS FOR MAKING SHAPED CONFECTIONS

Akimitsu Hamamura, Utsunomiya, Japan, assignor to Fantasy Flavors Inc., Wheaton, Ill.

Filed Nov. 7, 1986, Ser. No. 928,417
Int. Cl.[5] B65B 39/14; A23G 9/00
U.S. Cl. 141—9 23 Claims



1. A process for making a shaped confection comprising the steps of:

extruding a confectionary material from a plurality of nozzles;

intermittently moving a plurality of containers to a stationary position under said plurality of nozzles for receiving the confectionary material extruded therefrom;

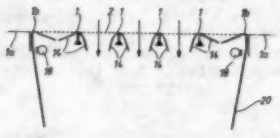
moving said plurality of nozzles in a vertical direction and laterally in a horizontal direction while extruding the confectionary material into the plurality of containers, whereby the plurality of nozzles move in a predetermined path and extrude a shaped confection in each of the containers in said plurality of containers.

4,942,911

HOPPER ASSEMBLIES

Abel Herbet, Paris, France, assignor to BTR Industrial Holdings, Ltd., London, England

Filed Jun. 29, 1988, Ser. No. 213,256
Claims priority, application United Kingdom, Jun. 30, 1987, 8715364
Int. Cl.[5] B65G 65/30
U.S. Cl. 141—359 14 Claims



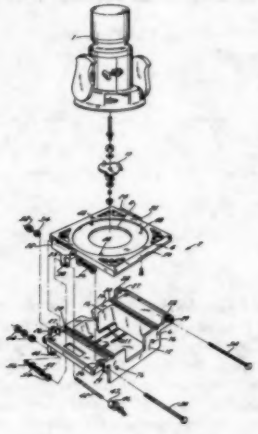
1. A hopper assembly having means defining an upwardly-facing mouth for receiving granular or powder materials; a plurality of support members extending across said mouth; a plurality of resiliently flexible baffles arrayed in a plurality of rows, each row consisting of a plurality of baffles, each said baffle being generally flat and rectangular and being fixedly mounted at, a top edge portion along said supporting member, the baffles in a row extending obliquely downwards side-by-side from respective said top edge portions to respective free edges, each baffle being flexible from said top edge to said free edge; and means for adjusting the angle of obliquity to the horizontal of the top edge portion of said baffle independently and for securing the top edge portion at a desired angle; each baffle being arranged to use to be disposed with its free edge parallel to and in the vicinity of an edge portion of another member disposed on an adjacent said support member, and being so arranged that if material is to be received by the hopper assembly falls onto any said baffle the weight of the material tends to cause the baffle to flex and the free edge of the baffle to move away from the said other member, permitting the material to fall between them, and that the baffle then tends to return resiliently to its original position, where it assists in preventing or reducing the escape of material upwards from the hopper through the mouth.

4,942,912

ROUTER ATTACHMENT

Ved P. Gakhar; Richard A. Dossett, and Wilfred M. McCord, Jr., all of Louisville, Ky., assignors to Vermont American Corporation, Louisville, Ky.

Filed Jun. 6, 1989, Ser. No. 362,215
Int. Cl.[5] B27C 5/10
U.S. Cl. 144—136 C 22 Claims



1. A router attachment for cutting into a surface of a workpiece, comprising:

a substantially flat plate adapted to be fixed to the bottom of a router and to rest on the top surface of the workpiece for aligning the router with the workpiece both before and during cutting;

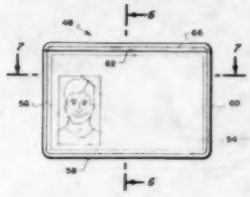
a base member defining a substantially flat front surface for abutting the face of the workpiece into which the cut is to be made both before and during cutting and having a top surface and defining a central opening in its top surface extending through the flat front surface, said central opening being large enough to receive a router bit; and

cooperating means on said substantially flat plate and said base member for mounting the flat plate on the base member to limit motion of the flat plate relative to said base member to a line perpendicular to said flat front surface so that said flat plate can start at a beginning position in contact with the top surface of the workpiece and then move along the top surface of the workpiece to control the height of the cut while permitting the router bit to plunge into the face of the workpiece, while the base member remains in fixed contact with the face of the workpiece.

4,942,913
WALLET

John A. Musso, 3737 Medea Creek, Agoura Hills, Calif. 91301

Continuation-in-part of Ser. No. 267,932, Nov. 7, 1988, abandoned. This application Jun. 5, 1989, Ser. No. 361,246
Int. Cl.[5] A45C *1/06, 11/18, 11/32*
U.S. Cl. 150—138 1 Claim



1. In combination with a large wallet, said large wallet having an internal article carrying compartment, a small wallet locatable within said article carrying compartment and totally confined therein, said small wallet removable from said article carrying compartment and separately carryable, said small wallet comprising:

three in number of thin-walled sheet material panels located in juxtaposition defining a first compartment and a second compartment, one of said panels forming a common wall for both said first compartment and said second compartment, said panels being of a polygonal configuration when observed flat-wise, said panels having peripheral edges including a top edge, said peripheral edges being secured together with the exception of said top edge, said top edge including a first access opening and a second access opening, said first access opening providing access into said first compartment, said second access opening providing access into said second compartment, a mating strip attachment mounted in conjunction with said second access opening, said opening, said mating strip attachment being locatable in either a closed position or an open position, said open position permitting access into said second compartment, said closed position preventing access into said second compartment, said common wall having an extension extending a spaced distance from said access opening so therefore said common wall being of a height greater than the remaining two said panels, said top edge of said remaining two said panels being lineal, said extension facilitating manual access through said access openings into and out of said first and second compartments;

the outer said panel of said first compartment being transparent with the remaining said panels being opaque; and

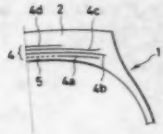
a divider wall located within said second compartment, said divider wall dividing said second compartment into a pair of separate compartments, one of said separate compartments being for the purpose of accommodating a conventional flat door key and the other of said separate compartment to accommodate folding currency.

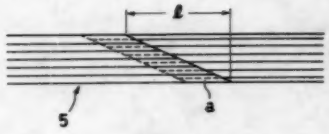
4,942,914
HEAVY DUTY AND MEDIUM PNEUMATIC RADIAL TIRE

Ken Takahashi, Atsugi; Kazuyuki Kabe, Tokyo, and Tatsuo Suzuki, Hayama, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 277,811
Int. Cl.[5] B60C *9/18, 9/28*
U.S. Cl. 152—531 5 Claims

1. A pneumatic radial tire having a belt layer composed of at least three layers each made of a metallic cord and disposed between a carcass layer and a tread, wherein (1) cords constituting the second belt layer as numbered from the carcass layer towards the tread and cords constituting the third belt layer as numbered from the carcass layer towards the tread are each provided at an angle of 10° to 30° relative to the circumferential direction of the tire and cross each other, (2) the first belt layer is separated into two parts at the central region of a crown and respectively disposed on both shoulder portions, said first belt layer being provided at a cord angle of 40° to 75° relative to the circumferential direction of the tire, and (3) at least one organic fiber cord layer having a cord angle of 0° to 10° relative to the circumferential direction of the tire is provided in a circular form in the circumferential direction of the tire in a space formed by the separation into two parts of the



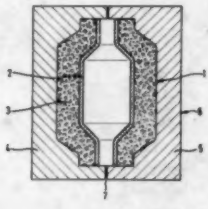


first belt layer between the carcass layer and the second belt layer at the central region of the crown, the total tensile strength of the cords of the organic cord layer is 240 kg/cm or more, one end of said organic fiber cord layer in the circumferential direction of the tire and the other end thereof are each diagonally cut and the cut ends are lapped on each other to form a splice in such a manner that the distance in the circumferential direction of the tire between one end in the widthwise direction of each cut end and the other end thereof is 120 mm or more, the space between said organic fiber cord layer and said carcass layer being 0.8 mm or more before vulcanization.

4,942,915
PROCESS FOR PRODUCTION OF A HOLLOW CASTING

Wilhelm Kallen, and Ulrich Quack, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to Eisengiesserei Monforts GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,670
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1987, 3728918
Int. Cl.[5] B22D *19/00*
U.S. Cl. 164—34 1 Claim



1. A process for producing a hollow metal casting, comprising the steps of:

providing a casting pattern having a foamed material body with a surface, said providing a casting pattern including forming said foamed material body in a shell mold having two halves, and an inner part having a refractory mold part covering said surface of said foamed material body; and

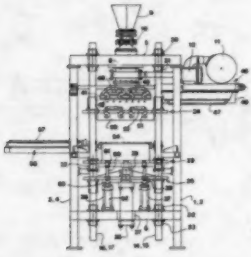
introducing a liquid metal onto said casting pattern to replace said foamed material body as said body transforms into a gas, whereby a hollow metal casting incorporating said refractory mold part is formed.

4,942,916

CORE BLOWING MACHINE

Roger W. Hale, Hinckley, and Gerald B. Senk, Jr., Cleveland, both of Ohio, assignors to Equipment Merchants International, Cleveland, Ohio

Filed Jul. 18, 1988, Ser. No. 220,082
Int. Cl.[5] B22C *9/12, 13/12, 15/22*
U.S. Cl. 164—186 **43 Claims**



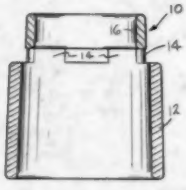
1. A vertical cope and drag foundry core blowing machine comprising an upright frame, a fixed blow head at the top of said frame, a set of guides mounted for vertical sliding movement in said frame, a cope mounting plate fixed to said guides beneath said blow head, a primary table adapted to support a drag mounted on said guides beneath said cope mounting plate for vertical sliding movement therealong, a secondary table beneath said primary table fixed to said guides, first clamp means to elevate said primary table to clamp a drag thereon against a cope to form a core box, and second clamp means to elevate said secondary table and thus said guides to clamp the core box against the blow head.

4,942,917

EXPENDABLE CASTING CORE FOR A CYLINDER

Byron W. Koch, and Robert I. Badenhope, both of Toledo, Ohio, assignors to Farley, Inc., Chicago, Ill.

Filed Jul. 11, 1989, Ser. No. 378,317
Int. Cl.[5] B22C *9/10, 9/24*
U.S. Cl. 164—369 **8 Claims**



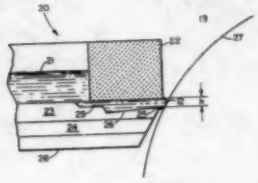
1. An expendable sand core for a jacket around a cylinder in a cylinder block, said core comprising a hollow frusto-core with a printout portion at its narrower end for locating said core in a die for casting said cylinder block.

4,942,918

CONTROLLED-FLOW FIBER CASTING

Robert E. Maringer, 815 Greenridge, Worthington, Ohio 43085

Filed Sep. 26, 1988, Ser. No. 249,618
Int. Cl.[5] B22D *11/06, 11/10*
U.S. Cl. 164—463 **15 Claims**



1. A process for directly casting fine metal fibers directly from the melt comprising

providing a cylindrical substrate having a casting region defined by a plurality of substantially parallel casting surfaces extending circumferentially therearound,

supplying melt from a tundish through a constrictor channel to an elongated orifice in the sidewalls or floor of the tundish having a length at the exit substantially larger than its height and substantially equal to the width of the casting region, and having the height aligned substantially parallel to the rotation of the casting surfaces, said constrictor channel in the tundish communicating the tundish with the orifice having a cross-sectional area smaller than the cross-sectional area of the orifice and having a dimension in the direction of the orifice length at the exit which is substantially less than the length at the exit of the orifice,

providing a meniscus of melt extending from the orifice,

rotating the cylindrical substrate such that the casting surfaces pass through the meniscus of melt and withdraw a melt layer on the casting surfaces in the casting region,

cooling the cylindrical substrate to solidify the layer of melt into fibers on the casting surfaces, and

removing the fibers from the casting surfaces.

7. A tundish for delivering molten metal under low pressure to a casting region on a rotatable, cylindrical substrate, the tundish comprising sidewalls and a floor defining a reservoir for molten metal, an elongated orifice in the sidewalls or floor of the tundish, and a constrictor channel in the tundish communicating the reservoir with the orifice, wherein said orifice has a length at the exit substantially larger than its height and substantially equal to the width of the casting region and having its height aligned substantially parallel to the direction of rotation of the cylindrical substrate, and wherein the constrictor channel has a cross-sectional area less than the orifice and a dimension in the direction of the orifice length at the exit which is substantially less than the length at the exit of the orifice.

4,942,919

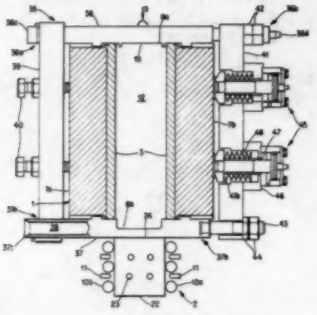
MOLD AND SUPPORT ZONE FOR CONTINUOUS CASTING

Michael Poran, Westwood; Carl Langner, Monsey, and Shlomo Hury, Woodcliff Lake, all of N.J., assignors to SMS Concast, Inc., Montvale, N.J.

Continuation of Ser. No. 157,292, Feb. 17, 1988, abandoned.
This application Mar. 17, 1989, Ser. No. 325,081
Int. Cl.[5] B22D *11/04*
U.S. Cl. 164—420 **16 Claims**

1. A continuous casting apparatus, comprising wall means

defining a mold cavity having two ends which are spaced from one another along a predetermined direction, one of said ends constituting an inlet for molten material and the other of said ends constituting an outlet for at least one continuously cast strand of the material; strand support means including a first strand support zone arranged to be located immediately downstream of said cavity and defining a strand guide channel designed to extend along said predetermined direction in substantial alignment with said cavity; a dividing wall designed to be removably mounted in said cavity so as to extend along said predetermined direction and thereby divide said cavity into a



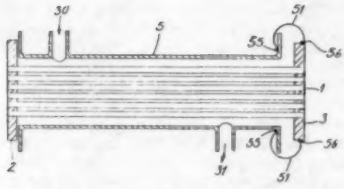
pair of substantially parallel casting passages; a partition designed to be removably positioned in said channel so as to extend along said predetermined direction in substantial alignment with said dividing wall and thereby divide said channel into a pair of substantially parallel guide passages, said partition being designed to extend along at least the major part of said channel; and clamping means designed to be removably mounted on said wall means so as to exert clamping pressure on the same, said clamping means being designed to carry said dividing wall and to clamp the latter in said cavity, and said clamping means further being designed to carry said partition.

4,942,920

HEAT EXCHANGER LEAK DETECTION

Raymond J. Chalifoux, and John Kozachuk, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Apr. 27, 1989, Ser. No. 343,601
Claims priority, application Canada, Jun. 16, 1988, 569673
Int. Cl.[5] G01M *3/28, 3/22*; F28F *11/00*
U.S. Cl. 165—1 **5 Claims**



1. A process to detect leaks in a partially disassembled floating head exchanger having a shell body, a floating head tube sheet and a floating head gap, said process comprising:

(i) attaching a lightweight highly flexible film or fabric membrane having low gas permeability to the perimeter of said floating head tubesheet with first membrane attachment means and to the outside of said shell body with second membrane attachment means, such that said membrane forms a continuous envelope which encloses said floating head gap but which does not cover the exterior end face of said floating head tube sheet, and

(ii) introducing pressurized gas into the shell such that said membrane is exposed to a gauge pressure of at least 2 pounds per square inch but less than 40 pounds per square inch, and

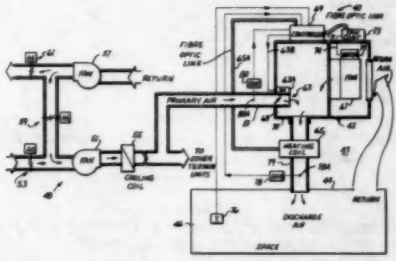
(iii) observing the exterior end face of said tubesheet for the presence of gas leakage.

4,942,921

FORCED AIR VENTILATION SYSTEM

David L. Haessig, Poway; Jamshid Hamidi, and Roger V. Hort, both of San Diego, all of Calif., assignors to Staefa Control Systems, Inc.

Filed Jan. 29, 1988, Ser. No. 150,247
Int. Cl.[5] G05D *23/00*
U.S. Cl. 165—16 **19 Claims**



1. A ventilation system for supplying conditioned low temperature primary air under pressure to a space, comprising:

sensing means for measuring continuously the quantity of primary air currently available for entering the space, the temperature of the air in the space, and the volume of air entering the space;

damper means for supplying a desired quantity of the currently available primary air under pressure to the space;

motive means for supplying a desired quantity of return air under pressure substantially continuously and uninterruptably to the space to condition the air therein;

signal means responsive to said sensing means for generating a pair of signals indicative of a desired quantity of return air conveyed from the space and a desired quantity of the currently available primary air under pressure needed to control the condition of the air in the space;

means for conveying return air from the space to said motive means;

primary air control means responsive to one of said signals for causing said damper means to vary continuously the quantity of currently available primary air under pressure for entering the space relative to the temperature in the space;

return air control means responsive to the other one of said signals for causing said motive means to vary continuously the flow rate of said return air under pressure in a functionally related manner relative to the quantity of available primary air currently needed to condition the air in the space; and

means responsive to said sensing means for causing said signal means to vary said signals substantially continuously and in a functionally related manner relative to the temperature in the space and the flow rate of the currently available primary air under pressure.

4,942,922

WELDED CORROSION-RESISTANT FERRITIC STAINLESS STEEL TUBING HAVING HIGH RESISTANCE TO HYDROGEN EMBRITTLEMENT AND A CATHODICALLY PROTECTED HEAT EXCHANGER CONTAINING THE SAME

Lawrence S. Redmerski, McKees Rocks; Kenneth E. Pinnow, Pittsburgh, and John J. Eckenrod, Coraopolis, all of Pa., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Filed Oct. 18, 1988, Ser. No. 259,520
Int. Cl.[5] F28F *21/08*
U.S. Cl. 165—134.1 24 Claims

19. A heat exchanger handling chemical media containing hydrogen sulfide or nascent hydrogen and fitted with welded corrosion-resistant ferritic stainless steel tubing having high resistance to hydrogen embrittlement, said tubing consisting essentially of, in weight percent,

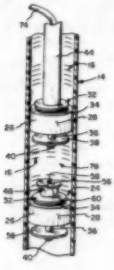
carbon at least 0.002,
nitrogen at least 0.002,
carbon plus nitrogen, 0.02 max.,
chromium 23 to 28,
manganese up to 1,
nickel 1 to 4,
silicon up to 1,
phosphorus up to 0.04,
sulfur up to 0.02,
molybdenum 2 to 5,
aluminum up to 0.1,
columbium 0.6 max. with columbium being at least equal to eight times carbon plus nitrogen, and balance iron and incidental impurities.

4,942,923

APPARATUS FOR ISOLATING A TESTING ZONE IN A BORE HOLE SCREEN CASING

Marvin D. Geeting, 5524 Cresthill Dr., Fort Wayne, Ind. 46804

Filed May 4, 1989, Ser. No. 347,504
Int. Cl.[5] E21B *33/124, 49/08*
U.S. Cl. 166—250 19 Claims



1. An apparatus for isolating a testing zone in a bore hole screen casing, said apparatus comprising:

lower plug means selectively placeable within the screen casing at a first selected point along the longitudinal length thereof for fluidly sealing the screen casing thereat and preventing fluid flow upwardly or downwardly through the screen casing;

upper plug means being detached from said lower plug means and selectively placeable independent of said lower plug means within the screen casing at a second selected point along the longitudinal length thereof above said lower plug means for fluidly sealing the screen casing thereat and preventing fluid flow upwardly or downwardly through the screen casing, whereby an isolated test zone is defined between said lower and upper plug means;

said upper plug means having a bore therethrough in communication with said defined isolated test zone; and,

fluid conduit means communicating with said isolated test zone through said upper plug means bore and extending out of the screen casing for accessing said defined isolated test zone.

4,942,924

LINER SETTING ASSEMBLY AND METHOD

Stewart M. Duncan, Jalan Nimur Raya No. 15, Tanah Kusir, Jakarta, Indonesia

Filed Feb. 13, 1989, Ser. No. 310,548
Claims priority, application United Kingdom, Feb. 12, 1988, 8803287; Nov. 1, 1988, 8803287
Int. Cl.[5] E21B *23/00, 33/14*
U.S. Cl. 166—290 10 Claims

8. A method of setting a liner into a casing string, the casing string being secured in a borehole, the method comprising:

(a) slidably fitting over the liner a first component and a second component, the first component having an outer peripheral wall, the first component having a first plurality of engaging devices disposed on the outer peripheral wall, the second component partially receiving the first component, the second component having a second plurality of engaging devices, each engaging device of the second plurality having a first surface and a second surface, the first surface engaging one of the first plurality of engaging devices;

(b) inserting the liner into the casing string, the liner having the first and second components fitted thereover;

(c) engaging the second surfaces of the engaging devices of the second plurality with the casing string at a preselected depth;

(d) introducing a bonding constituent into the borehole via the liner; and

(e) reciprocating the liner after the second surfaces of the engaging devices have been engaged with the casing string to enhance bonding of the liner to the borehole.

10. A liner setting assembly for use in setting a liner into a casing string being disposed in a borehole, the assembly comprising:

(a) a first component for slidably fitting over the liner to be set, the first component having outer peripheral walls, the first component having a first plurality of engaging devices disposed on the outer peripheral walls, the first plurality of engaging devices having engaging surfaces;

(b) a second component being adapted to receive the first component, the second component having a second plurality of engaging devices, each engaging device of the second plurality having a first surface and a second sur-

face, the first surface being engageable with a corresponding first surface of the first plurality of engaging devices, the second surface being engageable with the casing string; and

(c) means for permitting the liner to be reciprocatable within the borehole while the second component is set in the casing string.

4,942,925

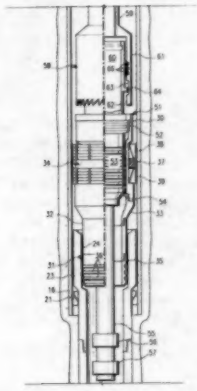
LINER ISOLATION AND WELL COMPLETION SYSTEM

Daniel J. Themig, Oklahoma City, Okla., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 21, 1989, Ser. No. 396,563

Int. Cl.[5] E21B *23/00, 23/06, 33/129*

U.S. Cl. 166—382 **16 Claims**



5. Apparatus for isolating the annulus around a wellbore liner and for achieving down-hole completion in a wellbore which transverses various earth formations, which comprises:

a first string of pipe positioned in said wellbore to serve as a liner for a first portion of said wellbore, said first string of pipe having an axial bore therethrough, the lower end of said first string of pipe being above the bottom of said wellbore,

a second string of pipe, means for hanging said second string of pipe from within the bore of the lower portion of said first string of pipe to serve as a liner for a second portion of said wellbore, said second portion extending downwardly from the lower end of said first string of pipe, said second string of pipe having an axial bore therethrough, the outer diameter of said second string of pipe being less than the inner diameter of the bore of said first string of pipe,

a tubular member extending upwardly from a first position within the bore of said second string of pipe to a second position within the bore of said first string of pipe above the upper end of said second string of pipe,

at least one first annular seal between a lower portion of said tubular member, located within said second string of pipe, and the interior surface of the bore of the laterally adjacent portion of said second string of pipe,

at least one second annular seal between an upper portion of said tubular member, located above said second string of pipe, and the interior surface of the bore of the laterally adjacent portion of said first string of pipe,

a third string of pipe positioned within the bore of said first string of pipe, said third string of pipe having on the lower end thereof an on-off tool, a latch and seal assembly connected to the lower end of said on-off tool, and a tailpipe extending downwardly from said latch and seal assembly, said latch and seal assembly being positioned within said tubular member, and said tailpipe extending at least partially into the bore of said second string of pipe,

said latch and seal assembly releasably securing said latch and seal assembly to said tubular member and providing a fluid seal for the annulus between the interior surface of tubular member and the exterior surface of said latch and seal assembly.

9. A method of isolating the annulus around a wellbore liner and for achieving downhole completion in a wellbore which transverses various earth formations, which comprises:

installing a first string of pipe in said wellbore to serve as a liner for a first portion of said wellbore, said first string of pipe having an axial bore therethrough, the lower end of said first string of pipe being above the bottom of said wellbore,

hanging, from within the lower portion of said first string of pipe, a second string of pipe to serve as a liner for a second portion of said wellbore, said second portion extending downwardly from the lower end of said first string of pipe, said second string of pipe having an axial bore therethrough, the outer diameter of said second string of pipe being less than the inner diameter of the bore of said first string of pipe,

positioning a tubular member so that it extends upwardly from a first position within the bore of said second string of pipe to a second position within the bore of said first string of pipe above the upper end of said second string of pipe,

providing an annular seal between a lower portion of said tubular member, located within said second string of pipe, and the interior surface of the bore of the laterally adjacent portion of said second string of pipe,

providing an annular seal between an upper portion of said tubular member, located above said second string of pipe, and the interior surface of the laterally adjacent portion of said first string of pipe,

lowering through the axial bore of said first string of pipe a third string of pipe, having on the lower end thereof an on-off tool, a latch and seal assembly connected to the lower end of said on-off tool, and a tailpipe extending downwardly from said latch and seal assembly, until said latch and seal assembly is positioned within said tubular member and said tailpipe extends at least partially below the bore of said tubular member, and

activating said latch and seal assembly to releasably secure said latch and seal assembly to said tubular member and to provide a fluid seal for the annulus between the interior surface of tubular member and the exterior surface of said latch and seal assembly.

4,942,926

DEVICE AND METHOD FOR CARRYING OUT OPERATIONS AND/OR MANIPULATIONS IN A WELL

Jacques Lessi, Maule, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

Filed Jan. 27, 1989, Ser. No. 302,333

Claims priority, application France, Jan. 29, 1988, 88 01089

Int. Cl.[5] E21B *23/00, 43/12, 43/14*

U.S. Cl. 166—385 **22 Claims**

1. Method for carrying out at least one of operations and manipulations such as measurements in a well having a casing means with a smaller diameter than a diameter of the well, the well being drilled into geological formations and having at least two distinct producing zones, the method comprising the steps of:

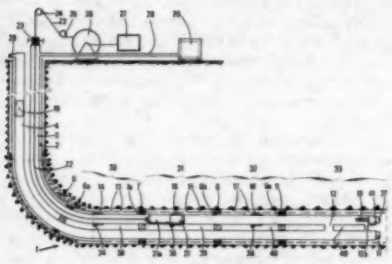
equipping each of said at least two producing zones of the well with at least one of an instrument means and tool means for performing said at least one of said operations and manipulations;

equipping said casing means with a first connector means usable in a liquid medium;

connecting the at least one of said instrument means and tool means to said first connector means by line means;

equipping a transmission cable means with a second connector means adapted to be connected to said first connector means;

introducing said transmission cable means into said casing means;



moving said second connector means until said second connector means cooperates with said first connector means; and

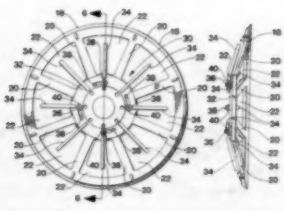
carrying out said at least one of said operations and manipulations by controlling said at least one of said operations and manipulations by controlling said at least one of said tool means and instrument means by said transmission cable means.

4,942,927

ADJUSTABLE SUGAR BEET HARVESTER LIFTER WHEEL FILLER SPOKES

Craig P. Halfmann, Rte. 2 - P.O. Box 215, Stephen, Minn. 56757-0215

Filed Jun. 27, 1989, Ser. No. 372,048
Int. Cl.[5] A01D *25/04*
U.S. Cl. 171—58 **13 Claims**



9. A lifter wheel filler spoke assembly comprising:

a ring plate;

a plurality of filler spokes attached to the ring plate, the filler spokes being spaced equally about the outside perimeter of the ring plate, and

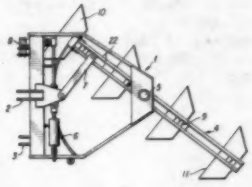
a plurality of fastening slots means provided in said ring plate for receiving fastener means for permanently fastening the lifter wheel filler spoke assembly to a lifter wheel in a fixed open or closed position.

4,942,928

BIDIRECTIONAL MOLDBOARD PLOW WITH ADJUSTABLE TILTING MECHANISM

Pompeyo B. Gomez, Monterrey, Mexico, assignor to Industrias John Deere, S.A. de C.V., Nueno Leon, Mexico

Continuation-in-part of Ser. No. 36,430, Apr. 9, 1987, Pat. No. 4,800,963. This application Oct. 24, 1988, Ser. No. 261,312
Claims priority, application Mexico, Apr. 9, 1986, 2115
Int. Cl.[5] A01B *3/40*
U.S. Cl. 172—219 **13 Claims**



1. A moldboard plow comprising:

a hitching frame having a first and second hitching plate;

a moldboard frame connected to said hitching frame;

a plurality of moldboards fastened to said moldboard frame, said moldboards being bidirectional and being attached to said moldboard frame such that they are rotationally rigid relative to the moldboard frame; and

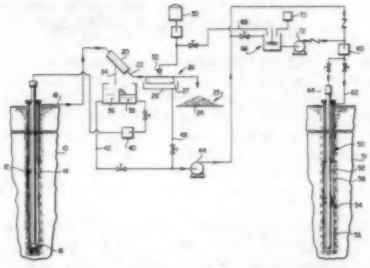
an adjustable tilting means mounted on said hitching frame for tilting said hitching frame about a generally longitudinal axis.

4,942,929

DISPOSAL AND RECLAMATION OF DRILLING WASTES

Edward Malachosky, Coppell, Tex., and Donna M. Lantero, Anchorage, AK, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 13, 1989, Ser. No. 322,585
Int. Cl.[5] E21B *21/06*
U.S. Cl. 175—66 **12 Claims**



1. A method for minimizing drilling wastes formed during the drilling of a wellbore into the earth including reclaiming selected solids of a first selected size and comprising gravel entrained in a drilling fluid and disposing of certain other solids entrained in said drilling fluid, said method comprising the steps of:

conducting drilling fluid from said well being drilled including entrained solids forming drilling cuttings to screening means, screening solids of said first selected size and comprising gravel from said drilling fluid and reclaiming said gravel;

separating said other solids forming a slurry containing said other solids, from said drilling fluid;

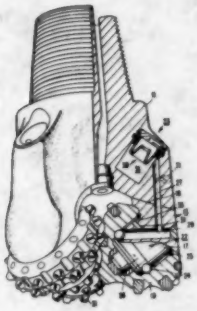
forming a slurry containing said other solids,
providing an injection well into an earth formation and defining a wellbore space; and
conducting said slurry to said injection well and injecting said slurry into said wellbore space.

4,942,930

LUBRICATION SYSTEM FOR AN EARTH BORING DRILL BIT AND METHODS FOR FILLING AND RETROFIT INSTALLING THEREOF

Stuart C. Millsapps, Jr., Houston, Tex., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Feb. 28, 1989, Ser. No. 316,770
Int. Cl.[5] E21B *10/24*
U.S. Cl. 175—228 14 Claims



1. Lubrication system of an earth boring drill bit of the type having a bit body, cutters depending from the bit body and rotatably mounted on bearings, a lubricant reservoir formed in said bit body, lubricant passage means for supplying lubricant from the reservoir to the bearings of the cutters, a cap sealed in the top of said reservoir, a folded wall-type, cup-like flexible diaphragm supported at one end by said cap and mounted so that the opposite unsupported end extends from said cap into said lubricant reservoir to contact lubricant disposed in said reservoir at a first side of the flexible diaphragm, and vent means provided in said cap for admitting well bore fluid into contact with said flexible diaphragm at a second, opposite, side thereof from that contacting the lubricant in the reservoir; wherein said cap has a recess that is peripherally bounded by an inner wall, the diameter of the recess being reduced relative to the diameter of the lubricant reservoir; and wherein an open end of said flexible diaphragm is sealingly mounted within said recess against said inner wall so as to extend into said reservoir with a sufficient peripheral clearance between the folded wall of the diaphragm and the reservoir so as to prevent damage to the diaphragm by expansion thereof, in use, against sharp edges of the reservoir.

8. Method of filling a lubrication system of an earth boring drill bit of the type having a bit body, cutters depending from the bit body and rotatably mounted on bearings, a lubricant reservoir formed in said bit body, lubricant passage means for supplying lubricant from the reservoir to the bearings of the cutters, a cap sealed in the top of said reservoir, a folded wall-type, cup-like flexible diaphragm mounted so as to extend from said cap into said lubricant reservoir so as to contact lubricant disposed in said reservoir at a first side of the flexible diaphragm, and vent means provided in said cap for admitting well bore fluid into contact with said flexible diaphragm at a second, opposite, side thereof from that contacting the lubricant in the reservoir, comprising the steps of:

(A) sealingly mounting a lubricating plug, having a through hole and an external configuration matched to that of the cap and diaphragm, within the reservoir;

(B) evacuating air from the lubricating system via a hose coupled to said through hole, and then filling the lubrication system with lubricant via said hose to a lubricant pressure of approximately 250 p.s.i.;

(C) removing said plug from said reservoir;

(D) filling a recess formed in a bottom end of the folded wall diaphragm with lubricant and mounting it on a shoulder ring; and

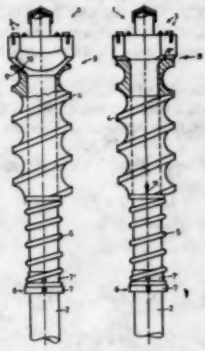
(E) sealingly mounting said cap in said reservoir with said diaphragm compressed against said shoulder ring and extending into said reservoir from said cap.

4,942,931

DRILLING TOOL HAVING FRICTIONALLY ROTATABLE DRILLING HEAD

Bernhard Moser, Altshausen, Fed. Rep. of Germany, assignor to Hawera Probst GmbH & Co., Ravensburg, Fed. Rep. of Germany

Filed May 31, 1989, Ser. No. 359,635
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1988, 3820697
Int. Cl.[5] E21B *10/44, 17/22*
U.S. Cl. 175—323 10 Claims



1. A drilling tool comprising:
a drill shank having first and second ends;
a drill head at said first end of said drill shank;
an interchangeable conveying helix disposed between said drill head and said second end of said drill shank, said conveying helix including a friction forming contact surface for axially supporting said drill head;
a spring supporting device attached to said drill shank at a location remote from said first end; and
a spring disposed between said conveying helix and said spring supporting device and pre-loading said conveying helix for forcing the contact surface of said helix against said drill head for frictionally engaging said helix and said drill head.

4,942,932

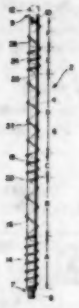
AUGER DRILLING SYSTEM

Ross W. Bracewell, 5060 Chestnut Street, Pierrefonds (Montreal), Quebec, Canada

Filed Jan. 30, 1989, Ser. No. 302,917
Int. Cl.[5] E21B *17/22*
U.S. Cl. 175—323 19 Claims

1. An auger for use in drilling into the earth under rotative movement in one direction of rotation, the auger having a cylindrical stem and a helical flight extending along the length of the stem, the helical flight being defined by adjacent seg-

ments of opposite flight orientation, the flight being broken 180° where it switches from one direction to the other and



being joined to form a wedge in the direction of rotation when it switches from the other direction back to the first.

4,942,933

RELATING TO ROTARY DRILL BITS

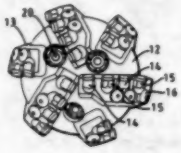
John D. Barr, and Michael T. Wardley, both of Gloucestershire, England, assignors to Reed Tool Company, Ltd., Dyce, Northern Ireland

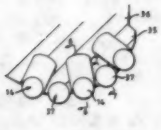
Continuation-in-part of Ser. No. 129,943, Nov. 25, 1987, abandoned, which is a continuation of Ser. No. 931,647, Nov. 17, 1986, abandoned. This application Sep. 29, 1988, Ser. No. 250,930

Claims priority, application United Kingdom, May 6, 1988, 8810751

Int. Cl.[5] E21B *10/46*

U.S. Cl. 175—329 **13 Claims**





1. A rotary drill bit for use in drilling or coring holes in subsurface formations comprising a bit body having a shank for connection to a drill string, a plurality of cutter assemblies mounted at the surface of the bit body, and a passage in the bit body for supplying drilling fluid to the surface of the bit body for cooling and cleaning the cutter assemblies, at least some of said cutter assemblies each comprising a cutting portion on a mounting body which is received in a socket in the bit body, the mounting body having a centerline disposed at an angle to the normal direction of forward movement of the cutter assembly in use of the bit, and at least three of the cutter assemblies being disposed closely adjacent one another in a row extending generally radially along the bit body, each two adjacent cutter assemblies in said row of at least three having the centerlines of their mounting bodies inclined at different angles to said normal direction of forward movement thereof as measured in planes parallel to said direction.

4,942,934

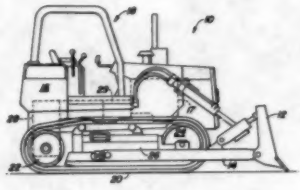
BELTED CRAWLER HAVING AUXILIARY DRIVE WHEEL

Kevin J. Moriarty, Davenport, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 17, 1988, Ser. No. 169,528

Int. Cl.[5] B62D *11/04*

U.S. Cl. 180—6.48 **20 Claims**



1. A crawler vehicle comprising:

a frame;

a power unit secured to the frame;

a main drive wheel connected to the frame;

an auxiliary drive wheel connected to the frame;

an endless belted track operatively engaging both drive wheels for propelling said vehicle;

a transmission for operatively coupling the power unit to the main drive wheel for driving the main drive wheel at a speed;

a pump operatively coupled to the power unit providing a fluid output;

a fluid motor operatively coupled to the auxiliary drive wheel, the fluid motor is fluidically coupled to the pump; and

a controller for controlling the fluid output of the pump so that the fluid motor drives the auxiliary drive wheel at a percentage of the speed for the main drive wheel that is different than the speed of the main drive wheel.

4,942,935

AUXILIARY POWER STEERING SYSTEM

Richard J. Lech, Lockport, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Jul. 14, 1989, Ser. No. 380,000

Int. Cl.[5] B62D *5/30, 5/06*

U.S. Cl. 180—133 **14 Claims**

1. An auxiliary system for steering a vehicle including:

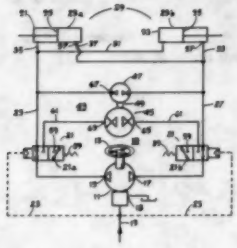
a power steering unit coupled to a vehicle steering wheel, said steering unit thereby made capable of being manually powered by a vehicle operator for providing a supply of fluid at a first pressure;

valve means connected between said steering unit and a pressure intensification device for selectively providing motive power to said device;

actuator means connected between said device and wheels of a vehicle for steering movement thereof;

said intensification device being powered for rotation by

said fluid at said first pressure when said steering unit is manually powered, said device thereby delivering hydraulic fluid to said actuator means at a second pressure for steering said vehicle.



4,942,936

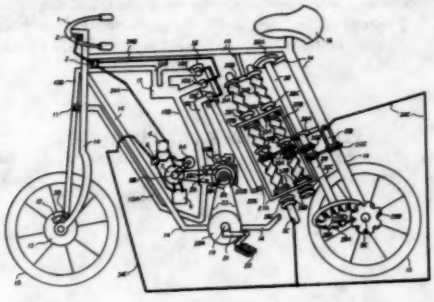
ELECTROHYDRAULIC/AIR BIKE

Elmer W. Gardner, Jr., P.O. Box 39463, Cincinnati, Ohio 45239

Filed Feb. 12, 1988, Ser. No. 156,910

Int. Cl.[5] B62M *23/02*

U.S. Cl. 180—207 **1 Claim**



1. A two wheeled motor and occupant propelled vehicle having a fluid power system driven by the occupant and an electric motor and also including means for recovery of kinetic energy comprising:

a pump for pressurizing a working fluid in an accumulator and to provide power to drive the vehicle;

a pedal crank and pulley journalled to the vehicle frame for operating said pump;

a D.C. electric motor and battery operatively connected for additionally driving said pump and providing regenerative braking;

a flywheel capable of storing potential energy operatively connected to said pump;

an alternator connected to said flywheel for charging said battery;

a cylinder motor connected by solenoid valves and conduits to said pump for receiving pressurized working fluid controlled by said solenoid valves;

a piston rod in said cylinder motor providing a reciprocating linear power output;

a pair of worm screw gears each including a worm screw journalled for rotation to the said vehicle frame and rectangular or square gear elements arranged in circumference around and engaging said worm screw for reciprocation therealong thus imparting rotation to said worm screw;

clutch means for selective engagement of said rectangular or square gears to said worm screws connected to said piston rod for linear reciprocation therewith;

An output shaft connected for rotation by said worm screw gears and to a wheel to drive the vehicle;

electric circuit means deriving power from said battery for selective control of said D.C. electric motor; for selective control of said solenoid valves, and for selective control of said clutch means during acceleration, deceleration and braking; and brake means on a wheel of said vehicle for receiving working fluid from said accumulator.

4,942,937

LOCKING DEVICE FOR A GEARSHIFT LEVER

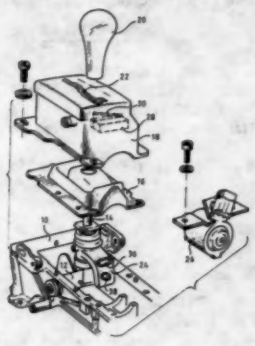
Franz Amberger, Altmannstein, and Wilhelm Bois, Gaimersheim, both of Fed. Rep. of Germany, assignors to Audi AG, Fed. Rep. of Germany

Filed Mar. 13, 1989, Ser. No. 322,370

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1988, 3835946

Int. Cl.[5] B60K *20/00, 41/06*

U.S. Cl. 180—271 **7 Claims**



1. Apparatus for an automatic transmission including:

a gearshift lever movable into various positions to effect different operating and drive conditions of said transmission;

an electrically excitable locking device for locking said gearshift lever in a park position;

a sensor switch for monitoring the position of said gearshift lever and being responsive to movement of said gearshift lever from said park position for electrically exciting said locking device to lock said gearshift lever in said park position.

4,942,938

SPACE UNIT FOR THE RECORDING AND/OR REPRODUCTION OF ACOUSTIC SIGNALS

Thomas Wiegel, Wielandstrasse 13, 1000 Berlin 41, Fed. Rep. of Germany

Filed Aug. 21, 1987, Ser. No. 87,773

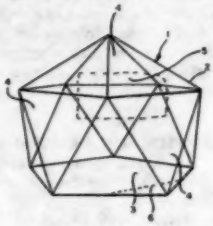
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3628590

Int. Cl.[5] E04B *1/99*

U.S. Cl. 181—30 **11 Claims**

1. A transportable, acoustical space cell (1, 10) for containing sound produced therein, said space cell adapted to be installed in closed rooms or out of doors for surrounding at least one of a means for recording sounds or a means for reproducing sounds, said space cell being closed on all sides and comprising a structure of truncated icosahedral configuration, said space cell being larger in size than a hemi-hedron, said truncated icosahedral structure having an interior volume and interacting with the sound existing in said cell to form a sound field within said space cell in which an ideal mixture of directly

transmitted sound characteristics reflected sound characteristics, and sound characteristic resulting from resonance of the structure occur, said sound field occupying approximately



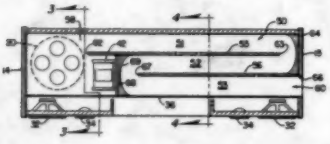
30% and 70% of the interior volume of said space cell and being located substantially at a center of said space cell, said recording means or reproducing means being locatable within said sound field.

4,942,939

SPEAKER SYSTEM WITH FOLDED AUDIO TRANSMISSION PASSAGE

Stanley N. Harrison, 6466 E. Ponderosa Dr., Parker, Colo. 80134

Filed May 18, 1989, Ser. No. 353,540
Int. Cl.[5] H05K *5/00*
U.S. Cl. 181—156 **17 Claims**



1. A modular loudspeaker cabinet comprising an elongated enclosure having a plurality of external walls, a woofer for generating sound over a predetermined frequency range mounted internally of said enclosure in one wall thereof in facing, open communication with an opening in said one wall of said enclosure, and an outlet sound port positioned in spaced relation to said driver element in another wall of said enclosure remote from said woofer, baffles extending in equally spaced parallel relation to one another within said enclosure to divide said enclosure into a plurality of communicating folded tubular passage sections extending from open communication with said woofer internally of said enclosure to terminate in said sound outlet port; and a heat sink provided between said woofer and said outlet port whereby air pulses generated by said woofer will cool said heat sink.

4,942,940

SCAFFOLD JACK

Patrick E. Boeshart, R.R. 1, Box 134, Sioux City, Iowa 51108

Filed Jul. 15, 1988, Ser. No. 219,214
Int. Cl.[5] E04G *1/20, 5/04*
U.S. Cl. 182—82 **14 Claims**

1. In combination:

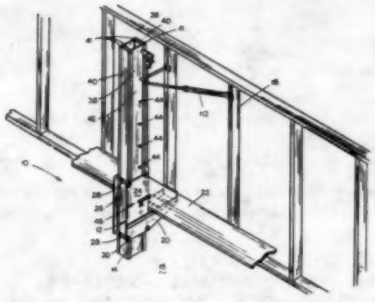
a vertically oriented post for supporting a jack and a working platform;

said post being formed from a pair of parallel and spaced-apart truss joists having spacers therebetween, each truss joist including a web portion connecting a pair of parallel flange portions;

said post having an upper end and a lower end, and said web portions forming a pair of opposing sides, the sides having a plurality of vertically-spaced and vertically-aligned apertures therein, the apertures in said opposing sides being horizontally aligned to receive a portion of a pawl for supporting a platform above the ground; and

a jack for supporting a working platform above the ground, comprising:

a jack housing operably connected to said post for vertical movement thereon; and



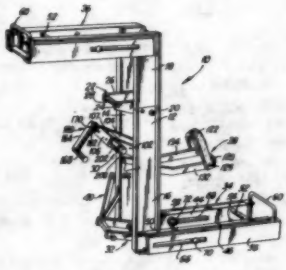
operable pawl means mounted on said housing, located to correspond with said web apertures in at least one side of said post, and operable for selective journaling in said apertures to prevent downward movement of said housing on said post when said pawl is journaled in an aperture.

4,942,941

ANTI-SPIN HANDLE FOR PUMP JACK

Carl Anderson, c/o Alum-A-Pole Corporation, P. O. Box 030066, Staten Island, N.Y. 10303-002

Filed Oct. 25, 1988, Ser. No. 262,465
Int. Cl.[5] A63B *27/00*
U.S. Cl. 182—136 **24 Claims**



1. A pump jack arranged for traveling up and down a pole, comprising:

a frame member;

a lower shackle member and an upper shackle member both supported on said frame member; and

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4,942,942

WEDGING TREE STAND

Ralph E. Bradley, 219 Mobile St., Aberdeen, Miss. 39730

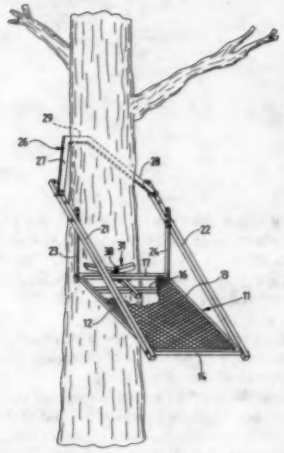
Continuation-in-part of Ser. No. 177,185, Apr. 4, 1988, abandoned. This application Dec. 12, 1988, Ser. No. 282,754
Int. Cl.[5] A45F *3/26*; A01M *31/02*
U.S. Cl. 182—187 **6 Claims**

1. Apparatus for supporting a person at a selected height in

a tree in the form of a sit and climb tree stand having a pair of independent assemblies positionable in spaced relation on a tree, each assembly comprising:

(a) a generally rectangular frame extending from one side of the tree, said frame having a plurality of rigid tubular members extending longitudinally and transversely therein;

(b) a platform member affixed to said frame for supporting a person thereon;



(c) a tree engaging bar in the form of a V having a pair of spaced apart legs offset from each other, said legs releasably attached to said frame such that said legs receive a tree of variable diameter in wedging engagement therebetween and support said frame therefrom; and

(d) means for urging said frame outwardly from said tree in selectable increments to position said platform in a generally horizontal plane.

4,942,943

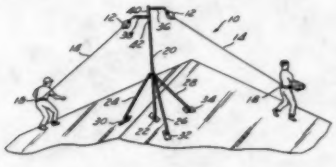
ROOFING SAFETY DEVICE

Brian J. Flaherty, Tustin, Calif., assignor to Davey Roofing, Inc., Irvine, Calif.

Continuation of Ser. No. 352,123, May 15, 1989, abandoned, which is a continuation of Ser. No. 213,772, Jun. 30, 1988, Pat. No. 4,852,692. This application Nov. 28, 1989, Ser. No. 443,069

Int. Cl.[5] A62B *35/00*

U.S. Cl. 182—231 **11 Claims**



1. A roofing safety device, comprising:

an axially elongated support member, having a top end and a bottom end;

at least one safety mechanism attached to said support member, said safety mechanism attachable to a worker on a roof so as to prevent said worker from falling off said roof;

at least three axially elongated elements for bracing or stabilizing said support member, each having an inner end and an outer end, said inner end attached to said support member; and

at least three feet, one foot being secured to each of said outer ends of said axially elongated elements and attachable to said roof or adjacent surface, at least two of said feet being rotatable about non-parallel axes.

4,942,944

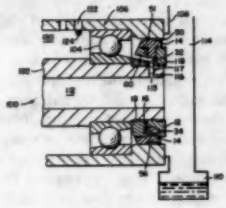
SCREW PUMP FOR LUBRICATING GENERATOR BEARING

Gary A. Frey, West Chester, Ohio, and James D. Lengel, Toms River, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 3, 1989, Ser. No. 332,064

Int. Cl.[5] F16N *7/18, 7/32, 7/36*

U.S. Cl. 184—27.1 **20 Claims**



1. Apparatus for providing a lubricating mist to a bearing in a rotating machine, comprising:

a housing having a circular opening and a passageway through which air can enter a cavity in said housing;

a rotor shaft secured in said housing for rotation therein having an axial opening, an axial bore extending from said axial opening through which a lubricant can be circulated and a radial passageway extending from a first opening at said axial bore to a second opening; and

a screw pump secured to said rotor shaft for rotation therewith and having a first orifice coincident with said second opening in said rotor shaft, a second orifice, a passageway extending from said first orifice to said second orifice through which said lubricant can be directed into said cavity to form the lubricating mist, a circumferential surface fitting within said circular opening in said housing, and a helical groove in said circumferential surface through which the lubricating mist is evacuated from said cavity during rotation of said rotor shaft.

4,942,945

BRAKE CYLINDER

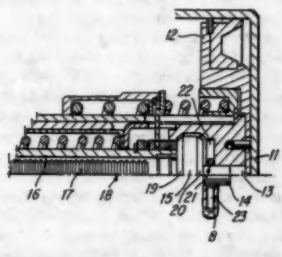
Hans Rocholl, and Horst Klein, both of Remscheid, Fed. Rep. of Germany, assignors to Bergische Stahl-Industrie, Remscheid, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 237,215

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728606

Int. Cl.[5] F16D *65/66*

U.S. Cl. 188—202 **4 Claims**



1. In a brake cylinder, for rail vehicles, that has a built-in, simple-acting linkage regulator for maintaining a uniform play,

with said regulator including two parts that can be shifted telescopically relative to one another, whereby one part is embodied as a spindle with a screw thread, and the other part is fixedly connected and screwed onto said spindle, with said other part that is connected being disposed on a coupling element that is provided with first coupling surfaces that cooperate with second coupling surfaces of a piston of an operating cylinder, comprising the improvement therewith wherein:

said coupling element, which is provided with said first coupling surfaces, is further provided with a centrally disposed pin that is guided longitudinally thereof in said piston of said cylinder; and

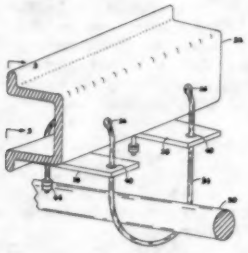
a damping member that is under pressure is clamped transversely onto said pin, with said damping member being secured in such a way that it cannot shift parallel to a longitudinal axis of said pin nor can it rotate with said pin to eliminate every unintended rotation in the linkage regulator for maintaining the uniform play so that adjustment remains constant and cannot vary, said damping member also being provided with the linkage regulator in a location and arranged to extensively suppress all vibrations and impacts in all axes, thereby even under the influence of resonance effects, preventing the coupling element from rotating on its own and hence changing the adjustment in an unacceptable manner, said damping member serving to eliminate every unintended rotation in the linkage regulator to avoid annulment of function thereof.

4,942,946

BOTTOM ROD SAFETY GUARD FOR RAILWAY BRAKE RIGGING

Carl E. Tack, Jr., Carol Stream, Ill., assignor to TransDyne, Inc., Chicago, Ill.

Filed Mar. 17, 1989, Ser. No. 325,383
Int. Cl.[5] B61H *13/34, 16/38*
U.S. Cl. 188—210 **2 Claims**



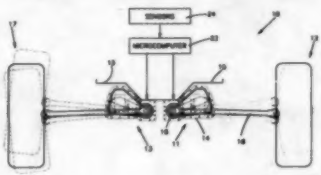
1. In a bottom rod safety guard for the brake rigging of a railway vehicle wherein the safety guard is in the form of a flexible resilient cable and is adapted to be supported from a brake beam and extend downwardly around a rod of said brake rigging, the improvement comprising a pair of connector members each having a first opening at one end slightly larger than the diameter of the cable and a second keyhole opening at the other end, with an enlarged portion of the keyhole opening being located toward a central portion of each connector member, first and second laterally spaced openings through the brake beam above said rod, said cable having an intermediate portion extending around said brake rod, the ends of the cable each having an enlarged terminus with said cable extending from said intermediate portion, through the first opening of the respective connector plates, through the respective first and second openings through the brake beam, and thence into latching engagement with the keyhole opening of the respective connector members.

4,942,947

ROTARY SHOCK ABSORBER WITH A CONTROLLED DAMPING RATE

Emil M. Shtarkman, Southfield, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Apr. 14, 1989, Ser. No. 339,126
Int. Cl.[5] F16F *6/00*
U.S. Cl. 188—267 **14 Claims**



1. A rotary shock absorber for use in a vehicle comprising:

a housing connectable with the vehicle frame and defining at least one chamber for a field-responsive fluid;

means for applying an energy field to the fluid in said chamber to vary the resistance to shear of the fluid as a function of the energy field acting thereon;

a shaft supported for rotation about its longitudinal central axis relative to said housing and extending in the direction of movement of the vehicle;

a rotor blade disposed in said chamber and connected with said shaft and extending radially of said shaft, the movement of said rotor blade in said chamber being resisted by the fluid; and

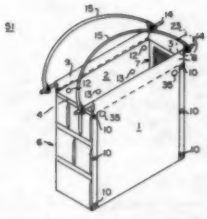
at least one arm having one end connectable to said shaft and extending radially of said shaft, the other end of said arm being connectable with a vehicle wheel for vertical movement with the vehicle wheel, said shaft rotating about its longitudinal central axis relative to said housing and said rotor blade moving in said chamber as the vehicle wheel moves relative to the vehicle frame, the resistance to movement of the arm varying as a function of the resistance to movement of said rotor blade in said chamber.

4,942,948

COMBINATION BEACH BAG/BEACH RECLINER

Donna M. Vickers, 474 Hazelwood Ter., Rochester, N.Y. 14609

Filed Feb. 10, 1989, Ser. No. 308,549
Int. Cl.[5] A45C *9/00*; B65D *33/00, 81/36*
U.S. Cl. 190—8 **6 Claims**



1. A beach bag/beach recliner comprising: a rectangular fabric element providing a front portion, back portion and bottom portion, the outer ends of each front and back portions including a sleeve formed thereon, each sleeve having a grommet at each end portion which grommet passes through only aid sleeve outer surface; two rectangular end portions, each having one side thereof as an integral portion of one of said portions of said fabric element, the remaining two sides of each

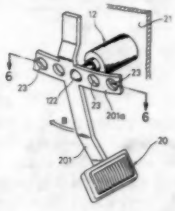
end portion being attachable to the remaining portions of said rectangular element by a plurality of snaps on its respective unattached sides periphery to engage corresponding snaps on respective sides of said other portions of said fabric element to formulate the bag mode; a pair of carrying straps and a pair of support rods, said support rods each being insertable within one of said sleeves, each said carrying strap having first means on the respective ends thereof to encompass each end of said support rods in said sleeve to provide an interlocking engagement therewith for carrying said element in a bag mode formed by the snapping together of said front, back, bottom portions and said end portions; each strap having second means on said ends to engage one end of each support rod in said recliner mode; each aforesaid end portion having on each outer side thereof a plurality of pockets and one the inner sides thereof an elastic net element forming an expandible pocket; a hinged rectangular rigid member dimensioned to be insertable selectively in one of said sleeves in said front and back portions to provide upper lateral support to said portion which provides support for the back of the user in the recliner mode, said rigid member including means on its extremities for engaging the ends of the support rods, one end of each of said support rod passing through the said grommet in said sleeve and being engaged with said rigid member at its extremities, the other end of each support rod cooperatively engaged with said second means on one of said straps to provide ground support to each rod to form the recliner mode.

4,942,949

ANTISLIPPING DEVICE FOR CARS IN A STATIONARY STATE

Yeu J. Dai, 2F1, No. 5, Lane 158, Sec. 2, Pao-Fu Road, Yungho, Taipei Hsien, Taiwan

Filed Jun. 12, 1989, Ser. No. 364,098
Int. Cl.[5] B60K *41/20*
U.S. Cl. 192—1.32 2 Claims



1. An antislipping device for vehicles in a stationary state, comprising:

means for detecting the rotation of one or more wheels of said vehicle and outputing a signal indicating whether or not said wheels are in a state of rotation;

means for detecting when an accelerator pedal of said vehicle is moved past a predetermined position and outputing a signal indicating the same;

means for holding a brake pedal of said vehicle in a braked position after said brake pedal has been moved into a braked position, comprising;

a retainer plate integrally formed with said brake pedal, having a plurality of aligned holes, each of said holes being provided with a taper on one inner side wall;

a longitudinal housing having a cavity therein and being provided with an opening at one end portion and a through hole at the other end portion, said housing being mounted in proximity to said retainer plate so as to place said through hole opposite said retainer plate;

a slide bolt slidably mounted within said housing so as to be able to extrude out of said housing through said through hole for a predetermined length and penetrate one of said holes in said retainer plate and also be able to retreat into said housing;

a cover that covers said opening of said housing;

means for urging said slide bolt to extrude from said through hole for a predetermined length so as to cause said slide bolt to penetrate one of said holes in said retainer plate, said tapers on said inner wall of said holes being configured so as to force said slide bolt, against said urging means, to retreat into said housing when said brake pedal is moved into a position corresponding to a greater degree of braking;

electromagnetic means for forcing said slide bolt against said urging means so as to retreat into said housing in response to a control signal from a control means;

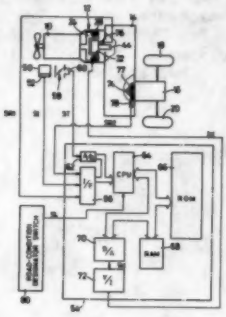
control means electrically connected with said rotational detecting means, said accelerator detecting means and said holding means, for receiving said signals from said detecting means and outputing a control signal to said holding means so as to cause said electromagnetic means to force said slide bolt to retreat into said housing when either said wheels are in a state of rotation or said accelerator pedal is moved past a predetermined position.

4,942,950

METHOD AND APPARATUS FOR CONTROLLING AN ELECTROMAGNETIC CLUTCH FOR USE ON A VEHICLE

Tomoyuki Watanabe; Setsuo Tokoro; Takashi Hayashi, and Takashi Shigematsu, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Continuation of Ser. No. 273,623, Aug. 25, 1988, abandoned, which is a continuation of Ser. No. 56,877, Jun. 3, 1987, abandoned, which is a continuation-in-part of Ser. No. 797,693, Nov. 13, 1985, abandoned. This application Nov. 27, 1989, Ser. No. 442,401
Claims priority, application Japan, Nov. 15, 1984, 59-241079
Int. Cl.[5] B60K *41/02*
U.S. Cl. 192—0.096 8 Claims



1. A method of controlling a clutch means having an electromagnetic coil which is incorporated in a power transmission system of a vehicle for transmitting a torque of an engine to drive wheels when the vehicle is started on a road surface having a low coefficient of friction wherein a transmission torque, transmitted by said clutch means, is varied with an electric current or voltage applied to said electromagnetic coil, said method comprising the steps of:

checking if a throttle valve of said engine is open and, increasing progressively a transmission torque which is transmitted by said clutch means, if said throttle valve is open;

designating whether a road surface on which the vehicle is driven has a low coefficient of friction by actuating a

switch to indicate the low coefficient of friction of the road surface;

detecing a slip of said drive wheels on said road surface; and

upon detection of the slip of the drive wheels while the road surface is designated as having a low coefficient of friction by actuation of said switch, reducing said transmission torque of the clutch means until the drive wheels have ceased to slip on said road surface.

2. An apparatus for controlling a clutch means which is incorporated in a power transmission system of a vehicle said clutch means having an electromagnetic coil, for transmitting an output of an engine to drive wheels, wherein a transmission torque transmitted by said clutch means is varied with an electric current or voltage applied to said electromagnetic coil said apparatus comprising:

road-condition designating means for indicating that a road surface on which the vehicle is driven has a low coefficient of friction comprising a switch which is actuated to indicate the low coefficient of friction of the road surface;

slip-deteciag means for detecting a slip of said drive wheels on said road surface;

means for checking if said road-condition designating means indicates that the road surface has a low coefficient of friction;

means for checking if a throttle valve of said engine is open; and

control means for increasing progressively said electric current or voltage if said throttle valve is open, and for reducing progressively said electric current or voltage in response to said slip detected by said slip detecting means while said road-condition designating means indicates by actuation of said switch that the road surface has a low coefficient of friction, said electric current or voltage being reduced until said drive wheels have ceased to slip on the road surface.

4,942,951

LIQUID FRICTION COUPLING AND MOTOR VEHICLE COMPRISING THE SAME

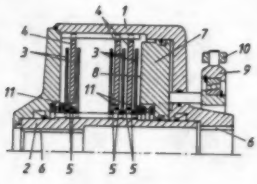
August Kriebernegg, Köflach, and Heribert Lanzer, Gössendorf, Othmar Peier, Pöllau, all of Austria, assignors to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Feb. 27, 1989, Ser. No. 316,476

Claims priority, application Austria, Mar. 11, 1988, 660/88

Int. Cl.[5] F16D *35/00*

U.S. Cl. 192—58 C **11 Claims**



1. A liquid friction coupling comprising

a housing,

a shaft, which is rotatably mounted in and coaxially protrudes into said housing,

interdigitating sets of interdigitating inner and outer blades, which are axially spaced apart and axially slidably mounted on said shaft and in said housing, respectively, and are non-rotatably connected thereto,

annular spreading springs disposed between adjacent blades of one of said sets and urging said adjacent blades axially apart to form gaps between said adjacent blades,

a viscous liquid located within said housing, said gaps between said blades being occupied by a liquid/air mixture, said liquid/air mixture transmitting torque between said adjacent blades,

an annular piston, which is sealed in and protrudes from said housing and is axially displaceable therein from and to an axially outermost position to decrease and increase, respectively, the axial distance between adjacent ones of said blades, and

actuating means for controlling the torque transmitted between said adjacent blades by adjusting the size of said gaps and the volume occupied by said liquid/air mixture between said adjacent blades, said actuating means being operatively connected to said piston outside said housing and operable to axially displace said piston in said housing, wherein

said annular piston has a planar inner end face, which is normal to the axis of said housing and extends substantially throughout the interior cross-section of said housing and close to said blades,

said liquid occupies not in excess of 60% of the liquid capacity of said housing, and

said liquid has a viscosity of at least 30,000 centistokes.

4,942,952

CENTRIFUGAL CLUTCH

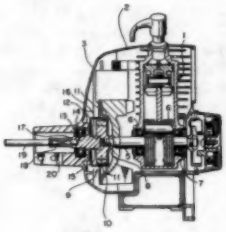
Yoshikiyo Kamata, Hachioji, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed May 22, 1989, Ser. No. 354,961

Claims priority, application Japan, May 26, 1988, 63-69768[U]

Int. Cl.[5] F16D *43/18*

U.S. Cl. 192—105 CD **1 Claim**



1. A centrifugal clutch comprising: a clutch boss rotatably and axially fixed supported to a drive side fixture; a clutch drum shaft rotatably supported to a driven side fixture and aligned coaxially with said clutch boss; clutch shoes movable radially outwardly by centrifugal force during rotation of said clutch boss; means for manually adjusting the coaxial alignment of said clutch drum and said clutch boss; and a clutch drum mounted on said clutch drum shaft for receiving transmitted drive force from said clutch boss through said clutch shoes, wherein said clutch boss has in its center an axial center hole; said clutch drum shaft has an inner end portion having an outer diameter somewhat smaller than an inner diameter of said center hole of said clutch boss; the inner end portion of said clutch drum shaft is arranged in the center hole of said clutch boss with a clearance for manual adjustment of the coaxial alignment of said clutch; and said driven side fixture and said drive side fixture are adjustable in relative position to each other.

4,942,953

SLEEVES FOR UNLOADING

Patrice Chefson, St.-Aubin les Elbeuf, France, assignor to Spirsgaine S.A., Saint Aubin les Elbeuf, France

Filed Mar. 23, 1989, Ser. No. 327,620

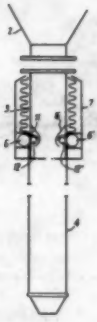
Claims priority, application France, Mar. 23, 1988, 88 03810

Int. Cl.[5] B65G *11/14*

U.S. Cl. 193—25 C **9 Claims**

1. A device for loading bulk products, of the type compris-

ing a retractable and extensible sleeve having an upper end and a lower end and adapted to guide bulk materials from an upper hopper towards a lower container, the sleeve being formed by a supple wall comprising successive reinforcing annular hoops and successive portions of said supple wall between the said hoops, the device further comprising mechanical lifting means to actuate one end of said sleeve which is thus retracted and extended, respectively, and the sleeve in the actuated end is caused to form successive folds of the portions of the supple wall between two successive hoops, the said retracted end of



the sleeve thus being placed in inactive position, wherein said device further comprises an inner protecting liner disposed at the end of the sleeve to be actuated for retraction and extension, respectively, the liner being concentric and inside the sleeve and of a diameter corresponding substantially to a small clearance to the inner diameter of the said folds of the portions of the supple wall folded in accordion manner between two successive reinforcing hoops, the liner thus being adapted to receive against its outer wall the retracted end of the sleeve placed in inactive position and thus protected from the abrasive action of the materials.

4,942,954

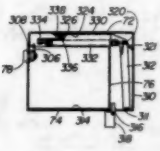
VENDING MACHINE

Thomas A. Nesser; Deborah L. Nesser, both of Rochester; Herbert Luckower, Harrison; John P. Barczak; Edward P. Joslyn, both of Rochester, and Bernard J. Rick, Fairport, all of N.Y., assignors to G. T. Norton, Inc., Rochester, N.Y.

Division of Ser. No. 277,483, Nov. 29, 1988, which is a continuation of Ser. No. 87,487, Aug. 20, 1987, abandoned. This application Jul. 5, 1989, Ser. No. 375,564

Int. Cl.[5] G07F 9/06

U.S. Cl. 194—351 **4 Claims**



1. Coin receiving apparatus which comprises a coin box having a coin container having an opening for receiving coins, a closure plate moveably mounted in said container and being moveable in opposite directions to open and close said opening, means internal of said container for biasing said closure plate to move in the closing direction, first detent means for latching said plate in open position, and second detent means with respect to which said container is moveable and having means enabling it to be engaged and moved by siad first detent means when said container moves towards said second detent means so as to leave said first detent means in latched relationship with said open closure plate and to be engaged by said first detent means when siad container moves away from said second detent means for actuating said first detent means to release said closure plate for movement in the closing direction.

4,942,955

CONTAINER TRANSFER SYSTEM

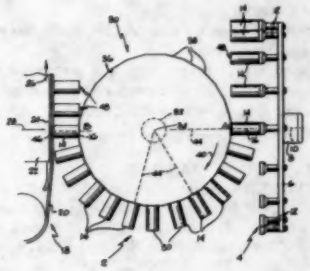
Frank L. Shriver, Lakewood, and Robert H. Schultz, Broomfield, both of Colo., assignors to Adolph Coors Company, Golden, Colo.

Continuation-in-part of Ser. No. 69,397, Jul. 1, 1987, Pat. No. 4,771,879. This application Jul. 7, 1988, Ser. No. 216,231

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[5] B65G 47/91

U.S. Cl. 198—471.1 **12 Claims**



1. Apparatus for transferring cylindrical containers or the like having a cylindrical container body portion and an open rim end portion and a closed bottom end portion between a first work station such as a container decorator or the like and second and third work stations such as ovens or the like comprising:

first continuously rotating container carrying means having a plurality of container supporting devices mounted thereon for receiving containers from the first work station and engaging the closed bottom end portion thereof and carrying the containers in a first circular path of movement in a first generally vertical plane about a central generally horizontal axis of rotation;

continuously rotating container transfer wheel means having a plurality of container supporting devices mounted in circumferentially spaced relationship on the circumferential peripheral surface thereof for receiving containers from said first container carrying means and engaging the open rim end portions thereof and carrying the containers in a second circular path of movement in a second generally vertical plane, which is transverse to said first generally vertical plane, about a second central generally horizontal axis of rotation which is transverse to said first axis of rotation and which includes a path portion adjacent said first container carrying means whereat the containers are transferred to said container transfer wheel means from said first container carrying means;

said container transfer wheel means having separating means for separating said containers in said second circular path into two parallel spaced apart circular paths;

spaced apart second and third continuously moving container carrying means having container supporting means thereon for receiving containers from said container transfer wheel means and engaging the closed bottom end portion thereof and carrying the containers to said second and third work stations along paths of movement, said paths of movement including linear path portions adjacent

said circumferential peripheral surface means on said container transfer wheel means whereat the containers re transferred from said container transfer wheel means to said second and third continuously moving container carrying means;

wherein said plurality of container supporting devices on said container transfer wheel means comprises:

a plurality of equally circumferentially spaced pads having a generally planar surface of a larger area than the cross-sectional area of said containers so as to enable each of said pads to abuttingly engage the open rim end portion of one of the containers;

vacuum supply means for each of said generally planar surfaces of said pads for supplying vacuum thereto to hold a container thereon during transfer from said first container carrying means to said second and third container carrying means; and moving means for moving each of said plurality of pads in a linear path parallel to said axis of rotation of said second container transfer wheel means;

said plurality of pads are successively numbered as odd and even numbered pads; and

said moving means moves said odd numbered pads in a linear path in one direction and said even numbered pads in a linear path in an opposite direction.

4,942,956

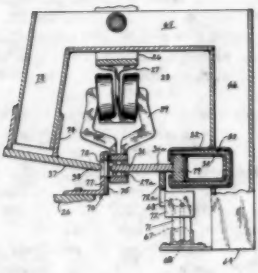
PART INDEXING AND POSITIONING APPARATUS

John N. Acker, and Bradley M. Andrese, both of Sturgeon Bay, Wis., assignors to Therma-Tron-X, Inc., Sturgeon Bay, Wis.

Filed Dec. 30, 1988, Ser. No. 298,473

Int. Cl.[5] B65G *37/00*

U.S. Cl. 198—465.3 **15 Claims**



1. A load indexing apparatus for precise powered motion of an elongated member, comprising a linear guide unit having a predetermined cross section, a driven unit movably mounted in said guide unit for linear movement therein, a reciprocating drive unit operable between a first position and second position along the path of said guide unit, a coupling connected to said driven unit and to said reciprocating drive unit, a movable support structure connected to said guide unit and operable to move the guide unit laterally to the line of movement of said drive unit, a positioning unit to move said movable support structure, said driven unit having at least one coupling member aligned for selective engagement with the elongated member in said first and second positions, and said driven unit including a first lateral position engaging said elongated member and a second lateral position disengaged from said elongated member for return movement of said driven unit from said second position to said first position, and a brake unit connected to said guide unit and positioned by said guide unit in a first engaged position to hold said elongated member in fixed relation when said driven unit is in said second lateral position.

4,942,957

CONVEYING ROLLER APPARATUS

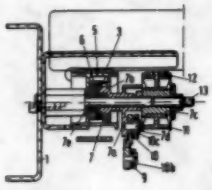
Edgar Bonifer, Münster; Walter Dutting, Offenbach am Main; Jahns, Werner, Seligenstadt, and Helmut Krats, Rodgau, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed May 18, 1989, Ser. No. 353,742

Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817388

Int. Cl.[5] B65G *13/06*

U.S. Cl. 198—781 **15 Claims**



1. In a conveying roller apparatus having holding locations for the material to be transported and including supporting rolls (2) and switch bars (4) which can be moved into the path of transport for releasing a drive belt (3) from the supporting rolls (2), the drive belt (3) being guided by belt rolls (5) which can be raised and lowered, each belt roll being mounted on an eccentric ring (7*b*) of a switch roll (7) which is mounted on an eccentric support axis (13), the switch roll (7) having adjacent the eccentric bearing ring (7*b*) an eccentric support ring (7*c*) for a brake roll (11) which, in its raised position presses at a brake belt (12), which is fixed in the direction of transport, from below against the supporting rolls (2), all switch rolls (7) of a holding location being controlled by an axially displaceable switch plate 10, the improvement comprising:

a pivotally mounted lever forming said switch bar (4) having a lower end (4*a*); a control element (8) mounted on said side plate (1) for engagement by said lower end (4*a*) of said lever; a straight lever (7*a*) having one end thereof attached to said switch roll (7) in fixed position, said switch plate (10) being pivotally connected to the other end of said lever (7*a*) of said switch roll (7) by pin joints (10*b*); a positioning apparatus (9) pivotally attached to said switch plate (10) and operatively connected to said control element (8) for control by said element; and a logic circuit (15) connected to said control element (8) and said positioning apparatus (9).

4,942,958

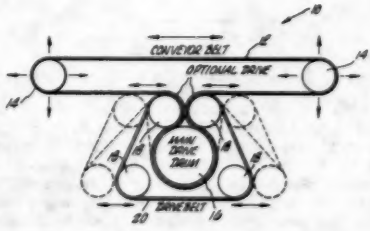
BELT-DRIVE CONVEYOR SYSTEM FOR REFUSE

Erik A. Marttila, 9785 Flying Mane La., Alta Loma, Calif. 91701

Filed Feb. 7, 1989, Ser. No. 307,762

Int. Cl.[5] B65G *23/14;* B60P *1/38*

U.S. Cl. 198—833 **5 Claims**



1. A conveyor belt drive system located in the floor of a

container used for transporting refuse and semi-liquid sludge comprising

a main drive drum driven by an external power source;

at least six pulleys whose width is the same as said main drive drum;

a conveyor belt whose width is the same as said main drive drum, said belt being partially wrapped around at least two of said pulleys positioned horizontally apart, said belt also being partially wrapped around said main drive drum which is positioned between and below said pulleys about which said conveyor belt is partially wrapped;

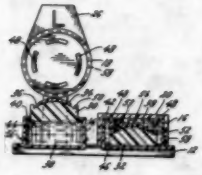
a drive belt means whose width is the same as said main drive drum, said drive belt means being partially wrapped around said main drive drum outside of but in close frictional contact with said conveyor belt, said drive belt also being partially wrapped around the remaining said pulleys, at least two of which are located below and to either side of said main drive drum and at least two of which are located above and to either side of said main drive drum, said upper pulleys forcing said drive belt means into close frictional contact with and thereby increasing both frictional contact pressure and frictional contact area with said conveyor belt as both said drive belt means and said conveyor belt are partially wrapped around said main drive drum.

4,942,959

BUOYANT STRUCTURES IN CONTACT LENS CASE

Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182, and Janet E. Truhler, 311 Woodridge Dr., Vadnais Heights, Minn. 55110

Filed Oct. 23, 1989, Ser. No. 425,103
Int. Cl.[5] A45C *11/04*
U.S. Cl. 206—5.1 **20 Claims**



1. An improved contact lens carrying case, comprising:

a base member including two contact lens storage compartments, each having an open end and adapted to hold a contact lens solution therein;

a pair of storage compartment caps moveable from a first closed position, closing a respective storage compartment open end, to a second open position, uncovering the respective storage compartment open end; and

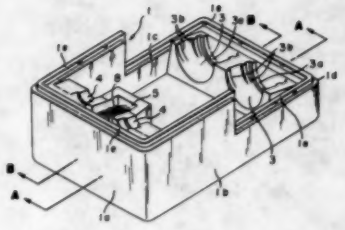
free floating pop-up lens retrieval structures located in each storage compartment, each of said structures having a density less than the contact lens solution enabling said structures to be buoyant, said structures being operably moveable to a first immersed position when said cap is in the closed position, and buoyantly rising in the contact lens solution to a second lens retrieval position adjacent said storage compartment open end when said cap is in the open position.

4,942,960

METHOD OF PRESERVING WINE IN A BOTTLE AND A WINE PRESERVING CONTAINER

Tomihisa Kawaguchi, 8-13, Jimyo-cho 1-chome; Akira Ota, 1-7, Okano-cho, and Akira Kawasaki, 5-2, Gobau-cho, all of Kano-shi, Niigata-ken, Japan

Continuation of Ser. No. 111,716, Oct. 23, 1987, Pat. No. 4,850,480. This application Apr. 5, 1989, Ser. No. 333,306
Claims priority, application Japan, Dec. 19, 1986, 61-303463; Sep. 21, 1987, 62-143990[U]
The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.
Int. Cl.[5] B65D *81/00*
U.S. Cl. 206—205 **1 Claim**



1. A wine preserving container which comprises: a container main body made of a heat insulating foamed material for receiving at least one bottle of wine; a cover made of said heat insulating foamed material to be put on said main body; a partition wall provided in said main body to form a partition chamber; a predetermined amount of water-absorbing material received in said partition chamber; concave means for receiving the neck portion of at least one bottle of wine at one end of said main body and said cover; and recess means for receiving the bottom portion of the at least one bottle of wine, wherein said partition chamber is formed in said main body so that said concave means are communicated with said recess means, a partition recess is formed at the upper edge of said partition wall to receive the shoulder portion of the at least one bottle of wine, and at least one projection is formed in said main body to support the bottom portion of the at least one bottle of wine so as not to cause lateral movement of the bottle, and wherein said heat insulating foamed material and said water absorbing material together impart a constant humid condition in said container.

4,942,961

CIGARETTE PACK, ESPECIALLY HINGE-LID PACK

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Continuation of Ser. No. 318,394, Mar. 3, 1989, abandoned. This application Jan. 19, 1990, Ser. No. 467,330
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806818
Int. Cl.[5] A24F *15/00*; B65D *85/10*
U.S. Cl. 206—254 **2 Claims**

1. A hinge-lid cigarette pack having an inner blank in which a cigarette group is wrapped, said inner blank comprising;

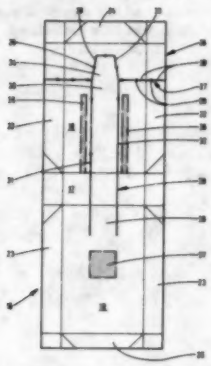
a pull-off flap (26) separable from the inner blank (16) by pulling off as a result of transverse punchings (27) in a front wall (18) and adjoining side tabs (22) of said inner blank (16); and wherein:

the flap adjoins a lift-out strip (30) which has a gripping tab (34) and which extends in said front wall (18) of the inner blank (16) and at least into a region of a bottom wall (17) of the inner blank;

the lift-out strip (30) is delimited from the pull-off flap (26) by a flap punching line (33) in such a way that the flap

(26), when being pulled off, can be easily separated from the lift-out strip (30);

the lift-out strip (30) extends into a region of the flap (26) and within the latter is delimited by an approximately U-shaped said flap punching line (33) in such a way that, when said flap (26) is pulled off, said gripping tab (34), which is free relative to the front wall (18) of the inner blank (16) and which is an upper free end portion of the lift-out strip (30), is exposed; and



said pack (39) comprises a hinge-lid (41) pivotably connected to a rear wall (45) of a pack part (40) also having a front wall (43) in an upper region of which there is provided an internal pack collar (42) which surrounds said blank punchings (27) before flap (26) is pulled off and from which said gripping tab (34) upwardly projects after said flap (26) is pulled off from said inner blank (16).

4,942,962

FREE STANDING GOLF BAG APPARATUS

Rodney B. Jordan, P.O. Box 39, Florien, La. 71429

Continuation-in-part of Ser. No. 272,344, Nov. 17, 1988, abandoned. This application Aug. 7, 1989, Ser. No. 394,245

Int. Cl.[5] A63B *55/00*

U.S. Cl. 206—315.7 9 Claims

1. A tubular golf club container with a means for supporting said container in a vertical position, said means comprising a chassis, said chassis further comprising a generally round disk having an upper and lower side, and a plurality of sod penetrating prongs, each having a top and bottom end, said top end being hinged to said lower side of said disk as to allow a 90 degree swing from a adjacent and parallel to said disk, to downward and perpendicular to said disk, wherein, said chassis further comprises a plurality of indentations within said lower side of said disk, said sod penetrating prongs being hinged to said lower side of said disk within said indentations as to facilitate being folded into a retracted position within said indentations.

4,942,963

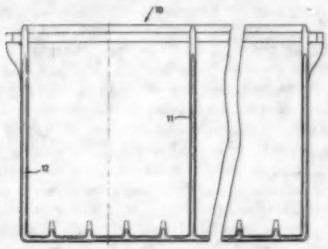
CONTAINER FOR STORAGE BATTERIES

Folco Gibellini, Carate Brianza, Italy, assignor to Aies Gibellini S.p.A., Milan, Italy

Filed Aug. 4, 1988, Ser. No. 228,115

Int. Cl.[5] B65D *85/30*

U.S. Cl. 206—333 5 Claims



1. An improved, substantially rigid, high impact strength container for electric storage batteries, characterized in that the container is embodied as a single piece of plastic material having a structure consisting of a relatively thin, rigid outer coat of said material, which is compact and of relatively high density, and a thicker inner core enclosed in said outer coat and being made of the same material as said outer coat but having a density appreciably lower than that of the material forming said outer coat, and wherein the said outer coat has a thickness in the range of from 1 to 2.5 mm, and said inner core has an average thickness of approximately 4 mm, the density of the inner core being up to 20% lower than that of the outer coat.

4,942,964

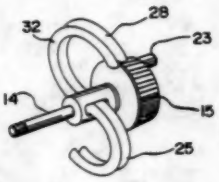
STORING BOX FOR BOOSTER CABLE

Pi-Chen Hsu, Taipei, Taiwan, assignor to Shirley S. Lan, Millburn, N.J.

Filed Aug. 22, 1988, Ser. No. 234,549

Int. Cl.[5] B65D *73/02*

U.S. Cl. 206—334 16 Claims

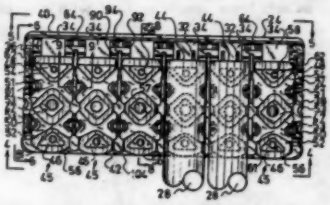


1. A booster cable storage assembly for storing a booster cable assembly having an electrically conductive cable with two ends and a clamp located at each of said ends, said storage assembly comprising a housing member, said housing member having a first compartment for receiving said cord, said first compartment having a first cable receiving opening and a second cable receiving opening, a second compartment for receiving said clamps, and a reel assembly, said reel assembly having a first portion located within said first compartment and a second portion located to the exterior of said housing member, said cable being positioned on said reel assembly, whereby rotation of said reel assembly causes said cable to be selectively wound and unwound with respect to said reel assembly, said second compartment having openings for receiving said clamps.

4,942,965
ELONGATED TRAY FOR SUPPORTING TUBULAR OBJECTS

Robert E. Comer, 1228 42nd Ave., Greeley, Colo. 80634

Filed Jul. 3, 1989, Ser. No. 375,338
Int. Cl.[5] B65D 85/42
U.S. Cl. 206—419 27 Claims



1. In an elongated tray of the type designed to support a plurality of tubular objects side by side from breaking in transit, and to uniformly distribute stresses occurring in the dropping of a package containing a plurality of trays and tubular objects, the improvement comprising:

(a) a plurality of vertically positioned side by side concaved shaped tubular receiving cavities formed in the tray:

(1) a plurality of tubular supporting surfaces formed in each tubular receiving cavity, the tubular supporting surfaces being formed with a plurality of upper undulation and striation free supporting cavities and a plurality of lower undulation and striation free supporting cavities, the upper supporting cavities and the lower supporting cavities being formed as support ribs underneath the tubular supporting surfaces with the upper and lower undulation and striation free supporting cavities being formed in a generally sinusoidal shape having a series of reversing curved configurations forming peaks and valleys;

(b) the tray being formed of a plastic material having a density ranging between 0.898–0.965 grams per cubic centimeter; and

(c) the thickness of the plastic material formed in the peaks and valleys of the upper and lower undulation and striation free supporting cavities being approximately of equal thickness so that the material forming the tray will not collapse upon a single load being applied but will have a controlled deformation with a controlled resilient return from the deformation upon a repeating load shock being applied to and removed from the tubular receiving cavities thereby permitting the tray to continue to function during repeated load shocks without collapsing during a single load shock.

4,942,966
CONTAINMENT DEVICE FOR A TEST TUBE

David R. Kemp, 2213 Richmond Rd., Paradise, Calif. 95969

Filed Jun. 5, 1989, Ser. No. 361,635
Int. Cl.[5] B65D 85/42
U.S. Cl. 206—521 3 Claims

1. A protective containment device for a single test tube adapted to allow predictable retrieval of said test tube from said containment device, comprising;

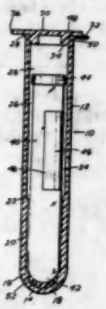
a tubular housing adapted to receive and internally retain said test tube in longitudinal alignment with said tubular housing, said tubular housing having a closed first end and an oppositely disposed opened second end;

said tubular housing having a first and a second internal diameter, said first internal diameter being adjacent said closed first end extending a distance toward said open second end, said second internal diameter being adjacent said opened second end extending a distance toward said closed first end, said second internal diameter being larger than said first internal diameter, a tapering from said first internal diameter to said second internal diameter adapted to provide guidance to a rounded structurally closed end of said test tube when inserted into said tubular housing, said first internal diameter sized to receive said structurally closed end of said test tube providing lateral support to said test tube, said second internal diameter sized larger diametrically than a removable rubbery stopper on said test tube, said first internal diameter sized to maintain said test tube generally centered in said tubular housing with said centering adapted to maintain a separation between said rubbery stopper on said test tube and said second internal diameter, said separation maintained between said rubbery stopper and said second internal diameter adapted to provide smooth sliding of said stoppered test tube from said tubular housing providing said predictable retrieval;

a cap affixed to said opened second end of said tubular housing by a living hinge, said cap adapted to temporarily close said opened second end of said tubular housing;

means adapted to provide liquid tight sealing between said cap and said opened second end when said tubular housing is closed by said cap;

a rubbery pad within said tubular housing at said closed first end adapted to provide protective cushioned support to



said rounded structurally closed end of said test tube when contained within said tubular housing;

said tubular housing being internally longitudinally longer than said stoppered test tube providing space between said rubbery stopper on said test tube and said cap when closed with said test tube fully inserted into said tubular housing toward said closed first end;

a rounded annular support ledge within said tubular housing between said closed first end and said first internal diameter, said support ledge encircling said rubbery pad, said support ledge adapted to contact said rounded structurally closed end of said test tube when said test tube is fully inserted into said tubular housing toward said closed first end, said support ledge adapted to cause said test tube to slide toward said opened second end of said tubular housing upon crushing of said closed first end;

said tubular housing and said cap manufactured of shatter resistant material.

4,942,967
BOTTLE RACK COMPONENT AND ASSEMBLY

Bernardus J. J. A. Schneider, Zuideindseweg 54, 2645, BH Delfgauw, Netherlands

Filed Aug. 14, 1989, Ser. No. 393,645
Int. Cl.[5] A47B 73/00
U.S. Cl. 211—74 13 Claims

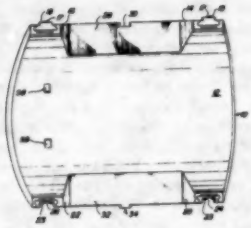
1. In a bottle rack which may include one or more bottle rack components, each of said rack components comprising:

a cradle having an upper bottle cradling surface with a plurality of upstanding legs and a lower surface said upstanding legs having upper ends;

a joint element on an outer surface and upper extremity of each of said upstanding legs adapted to form a joint con-

nection between a complementary joint element of an adjacently positioned bottle rack component;

an interconnecting member extending laterally on each side of said upper bottle cradling surface adapted to form an interconnection between adjacently positioned bottle rack components; and



a receptacle means positioned on the lower surface of said cradle adapted to receive the upper ends of a pair of upstanding legs which have been joined in order to permit the positioning of bottle rack components vertically one over other horizontally joined components.

4,942,968

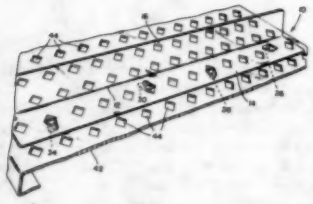
SHELF DIVIDER

Jacob Fast, 7561 NW. 9th St., Plantation, Fla. 33317

Filed Mar. 21, 1989, Ser. No. 326,794

Int. Cl.[5] A47F *5/00*

U.S. Cl. 211—184 **6 Claims**



1. A shelf divider for use on a shelf having rows of apertures, the divider comprising an elongate strip of material divided lengthwise into a shelf attachment panel and a divider panel, the attachment panel having four tabs spaced lengthwise along the divider panel to form a pair of inner tabs and a pair of outer tabs for insertion into respective apertures of an aperture row of the shelf, each tab having a base along which the tab can be flexed, the bases of the respective tabs being substantially colinear and extending lengthwise of the attachment panel, the tabs being spaced to conform with the spacing of the apertures, and with alternate tabs extending in opposite directions with respect to their bases.

4,942,969

VAPOR PRESSURE RETENTION APPARATUS

John A. Dickey, 516 Addison Ave. NE., Palm Bay, Fla. 32907

Filed Dec. 2, 1988, Ser. No. 278,781

Int. Cl.[5] B65D *23/10*

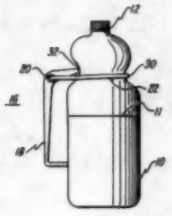
U.S. Cl. 215—100 R **8 Claims**

1. A pressurizing apparatus for placing around a flexible container holding a carbonated beverage, comprising:

a member for fitting loosely around the container, wherein said member includes a substantially straight portion and a first and a second free end spaced apart from said straight portion and located on opposite sides of said loosely fitting member;

a lever arm having first and second pivot points pivotably coupled to said first and said second free ends, respectively, includes a compression member substantially parallel to said straight portion and to a line connecting said first and second pivot points;

wherein as said lever arm is pivoted with respect to said



loosely fitting member, said compression member moves toward the plane of said loosely fitting member and closer to said straight portion until said compression member crosses the plane of said loosely fitting member thus latching said compression member in that position so as to squeeze the container between said compression member and said straight portion, thereby reducing the amount of carbon dioxide that comes out of solution from the beverage into the air inside of the container.

4,942,970

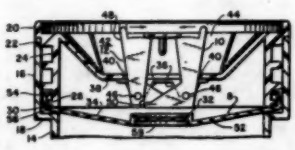
HERMETICALLY SEALED CANISTER

Murray Jay, Woodsburgh, N.Y. (Vivian Jay, executrix), assignor to Vivian Jay, Woodsburgh, N.Y.

Filed Jul. 14, 1988, Ser. No. 218,972

Int. Cl.[5] B65D *45/00*

U.S. Cl. 215—358 **1 Claim**



1. A hermetic seal unit for a container comprising a container having a lower portion, an upper portion of a slightly greater diameter than the lower portion, and a shoulder portion at the junction of the upper and lower portions;

a cover conforming in shape to the upper portion of said container;

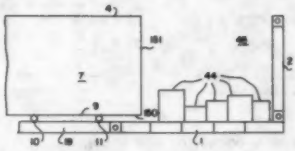
spreader elements pivotaly positioned in said cover; and

a hermetic seal element positioned on a lower portion of said cover and said spreaders being in contact with the inner surface of said hermetic seal element and said hermetic seal element being in intermittent contact with said top portion and shoulder of said container in order to intermittently define a hermetic seal.

4,942,971
CONTAINER

Peter Neugebauer, Barmstedt, and Helmut Meyer, Halstenbek, both of Fed. Rep. of Germany, assignors to Drehtainer Consulting GmbH, Hamburg, Fed. Rep. of Germany

Filed May 2, 1988, Ser. No. 188,806
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1987, 3734357; Jan. 7, 1988, 3800205
Int. Cl.[3] B65D 90/58
U.S. Cl. 220—1.5 38 Claims



1. A container comprised of:
a base plate having a longitudinal axis;
two end walls each extending from said base plate, each end wall having a top edge opposite said base plate and two opposing side edges extending from said top edge to said base plate; and
a hood extending from and over said base plate and between said two end walls, said hood being movably connected to said base plate so that said hood is longitudinally displaceable along said base plate, said hood being comprised of at least one rigid part, wherein at least one of said end walls is permanently secured to said hood and releasably secured to said base plate, located adjacent to said side edges of said end walls, wherein at least two of said corner posts (16, 17, 18, 19) are connected to said base plate (1) such that they can be tilted with respect to said base plate, said corner posts providing a load transmitting connection with said base plate so that said hood may move longitudinally along said base plate and said tilted corner posts.

34. A container comprised of:
a base plate having a length and a width and having a longitudinal axis along said length;
two oppositely located end walls, each of said end walls having two opposing side edges, said side edges and said end walls extending generally perpendicularly of said base plate;
a hood slidably attached to said base plate, said hood being comprised of generally two opposing sides which extend generally perpendicularly of said base plate and a roof extending between said two opposing sides and spaced from said base plate;
and corner posts located adjacent said side edges and forming the corners of the combination of said end walls, and hood, at least two of said corner posts being pivotably mounted to said base plate such that said at least two corner posts may be pivoted away from said end walls and toward said base plate to effectively extend the length of said base plate so that said hood can be displaced longitudinally along said base plate and onto said corner posts, said corner posts providing a load transmitting connection with said base plate.

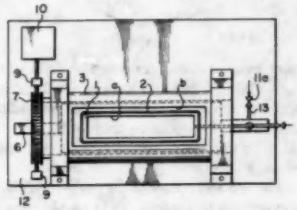
37. A container comprised of:
a base plate having a longitudinal axis;
two end walls, each having a top edge located opposite said base plate and two side edges extending from said top edge to said base plate;
a hood comprised of at least one rigid part and having a roof situated generally opposite of said base plate and two side walls connected to said roof and extending to said base plate, said side walls being movable on said base plate, said hood extending between said two end walls and being displaceable in the direction of said longitudinal axis by movement of said side walls along said base plate, at least one of said end walls being permanently connected to said hood; and
corner posts associated with said side edges and providing a load transmitting connection with said base plate.

38. A container comprising:
a base plate having a longitudinal axis;
a rigid hood comprised of a roof situated generally opposite of said base plate and opposing lateral walls connected to said roof and extending to said base plate from said roof, said opposing lateral walls being situated generally parallel to said longitudinal axis and defining lower edges which lower edges are guidable along said base plate, said hood being displacable along the direction of the longitudinal axis of said base plate;
two end walls each having a top edge located near said roof, a bottom edge located opposite said top edge and near said base plate, and sides connecting said top and bottom edges, at least one of said end walls being permanently connected to said hood at said top edge and releasably connected to said base plate at said bottom edge;
a mounting associated with said hood and located longitudinally of said base plate, said mounting providing said hood with a degree of perpendicular freedom with respect to said longitudinal axis;
packing sealably located between said base plate and said at least one end wall permanently connected to said hood; and corner posts associated with said sides of said end walls, said corner posts providing a load transmitting connection to said base plate.

4,942,972
PRESSURE VESSEL

Eiichi Hiraoka, Tokyo; Toshio Akagi, Kawasaki; Kiyotaka Yano, Kiyose, and Junji Onaka, Iruma, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Mar. 22, 1989, Ser. No. 327,449
Claims priority, application Japan, Mar. 25, 1988, 63-38360[U]
Int. Cl.[3] B15D 6/12
U.S. Cl. 220—3 6 Claims



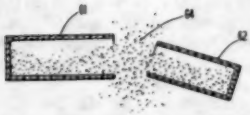
1. A pressure vessel, comprising:
a cylindrical, fixed body which is closed at the two ends thereof, the central portion of said body forming a sample accommodating space, said body having a opening formed in at least one lateral portion thereof; and
a drum body surrounding said fixed body in such a matter as to be rotatable relative to the outer periphery of said body, said drum body having an opening formed in a lateral portion at a position which faces said opening formed in said body at one point rotation.

4,942,973

CONTAINER FOR RELEASING FABRIC CONDITIONERS IN WASHING MACHINES

Stuart S. Bowie, 5 Woodbrook La., Swarthmore, Pa. 19081

Filed Mar. 27, 1989, Ser. No. 329,302
Int. Cl.[5] B65D *43/04*
U.S. Cl. 220—201 5 Claims



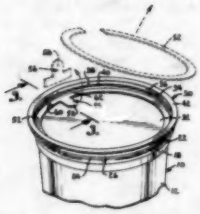
1. A container for clothes conditioner(s) and the like, said container comprising at least two components of substantially rigid materials which are held together by frictional engagement at room temperature and wherein the components comprise different materials having substantially different coefficients of linear expansion, whereby one of said components contracts so much more than the other component in the cold rinse water of a washing machine that the components detach and release conditioner(s) into the rinse water of the washing machine.

4,942,974

TAMPER EVIDENT CONTAINER

Owen D. Larrison, Hacienda Height, Calif., assignor to Sealright Company, Inc., Kansas City, Mo.

Filed Jun. 9, 1989, Ser. No. 366,531
Int. Cl.[5] B65D *53/00, 55/02*
U.S. Cl. 220—214 14 Claims



1. A tamper evident container assembly comprising:

a container having a hollow interior for holding materials packaged therein and an open top for providing access to the interior and the contents thereof;

a removable lid applicable to the container to close said top thereof, said lid covering said top of the container when applied thereto and presenting a peripheral portion engaging the container in a manner to releasably retain the lid on the container, said peripheral portion being deformable to release from the container to permit removal of the lid; and

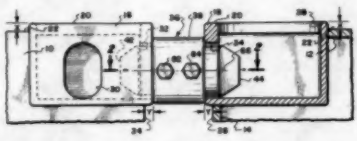
a relatively stiff annular ring member overlying the lid and having a central opening therethrough exposing the lid and informational material thereon, said ring member being in engagement with said peripheral portion of the lid to resist deformation of said peripheral portion and said ring member having a frangible section which may be broken away to release the ring member from the lid to permit initial removal of the lid from the container.

4,942,975

CONTAINER CONNECTOR HAVING A SKEWED INSTALLATION CONFIGURATION

Mark E. Capron, Oxnard, and James F. Jenkins, Ventura, both of Calif., assignors to The United State of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 5, 1989, Ser. No. 375,682
Int. Cl.[5] B65D *21/02*
U.S. Cl. 220—23.4 6 Claims



1. A container connector comprising:

a grab bar, said grab bar having a first end and a second end, said first end being substantially identical to said second end, a first longitudinal center axis extending between said first end and said second end, said first end including first retaining means said second end including second retaining means, said first retaining means comprising a first groove formed within the body of said grab bar, said second retaining means comprising a second groove formed within the body of said grab bar, both said first groove and said second groove having an outer wall and an inner wall, each said inner wall being in a plane substantially perpendicular to said first longitudinal center axis, each said outer wall being inclined relative to said first longitudinal center axis, the spacing between said inner walls being slightly greater than the length of said enlarged center section of said position bar, said first retaining means adapted to connect with a first shipping container, said second retaining means adapted to connect with a second shipping container;

a position bar mounted in spaced relationship from but in juxtaposition to said grab bar, said position bar having a second longitudinal center axis, said position bar having an enlarged center section terminating at each longitudinal end in a protruding flange, one said flange to engage with the first shipping container and the other said flange to engage with the second shipping container; and

interconnection means connecting said grab bar and said enlarged center section of said position bar, said interconnection means being adjustable to vary the position of said grab bar relative to said position bar, said first longitudinal center axis being parallel to said second longitudinal center axis when said container connector is installed in its operating position, during installing of said container connector said first longitudinal center axis is located skewed to said second longitudinal center axis.

4,942,976

CONTAINER CLOSURE WITH SPIGOT VALVE

Steven R. Spencer, Kansas City, Mo., assignor to Tapour, Inc., Kansas City, Mo.

Filed Oct. 17, 1988, Ser. No. 258,669
Int. Cl.[5] B65D *51/18*
U.S. Cl. 220—254 9 Claims

1. A container closure having a spigot valve and comprising:

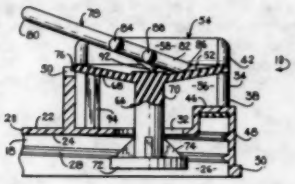
a lid for the container and having a hole therein, the spigot valve being carried by the lid in association with the hole and including:

a shiftable sealing assembly for opening and closing the hole;

resilient means forming part of the assembly and shiftable from a first position to a second position;

lever means for shifting the resilient means from said first position closing the hole to said second position opening the hole by acting upon said resilient means,

said lever means overlying the resilient means and having a handle portion and a cam portion, said portions being on opposite sides of a pivot point for the lever, the cam portion being in direct engagement with the sealing assembly; and



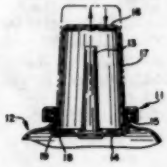
means for retaining said lever to hold the resilient means in the second position and, therefore, the hole in open condition to permit egress of the contents of the container.

4,942,977

BREAKAWAY TAMPER EVIDENT COVER

Daniel P. Hidding, Rte. 2, Ridgecroft La., Barrington Hills, Ill. 60010

Filed Dec. 8, 1988, Ser. No. 281,466
Int. Cl.[5] B65D 17/40
U.S. Cl. 220—276 6 Claims



1. A tamper evident cover for use with a container having a closure with a surrounding outwardly extending closure bead and a closure inner portion formed under the inside of the closure bead, and a nozzle extending upwardly through the closure for discharging the contents of the container therethrough, said cover comprising:

a generally circular top portion;

a generally cylindrical sidewall extending downwardly from the edge of said top portion forming a generally circular rim equally spaced from said top portion;

a flat, substantially continuous and horizontal flange extending outwardly from said rim over said closure bead;

a locking ring adapted to surround the outwardly extending closure bed, having an inwardly extending locking flange for engaging under the outside of the closure bead to secure the locking ring to the container;

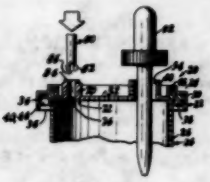
a frangible tear line overlying said closure bead and connecting said locking ring to said outwardly extending flange whereby after said frangible tear line has been ruptured, said cover sidewall and said outwardly extending flange may be forced downwardly into the closure beneath said closure bead and said outwardly extending flange will spring outwardly to engage said closure inner portion under said closure bead to removably retain said cover in position.

4,942,978

PROTECTIVE LINER FOR CONTAINERS

David M. Bessette, 808 Linden St., Cleveland, Wis. 53015

Continuation-in-part of Ser. No. 282,651, Dec. 12, 1988, abandoned. This application Apr. 24, 1989, Ser. No. 342,298
Int. Cl.[5] B54G 5/00
U.S. Cl. 220—470 3 Claims



1. In a flexible fluid-tight liner for a container, a flexible membrane forming a first material shaped to fit into close contact with the interior surface of the container,

a plurality of tubes each held in close proximity to the flexible membrane,

said tubes being inflatable and filled with material under pressure whereby each of said tubes forms a stiffening rib or ring which then holds the first membrane against the interior wall of the container even when the

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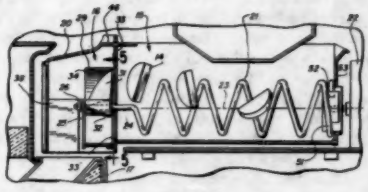
4,942,979

ICE DISPENSING APPARATUS

William J. Linstromberg, Lincoln Township, Berrien County; Donald E. Janke, Benton Township, Berrien County, and Chris A. Scriber, St. Joseph, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Continuation-in-part of Ser. No. 500,324, Jun. 2, 1983, abandoned. This application Jun. 24, 1985, Ser. No. 747,890
Int. Cl.[5] G07F 11/36
U.S. Cl. 221—75 35 Claims



1. In an ice dispensing apparatus for selectively dispensing uniform quantities of elongated ice pieces from an ice storage receptacle defining an ice transfer position and means for urging the ice pieces in the receptacle generally horizontally toward said transfer position, and baffle means spaced from said transfer position, said baffle means having a generally horizontal upper edge which defines a dispensing position, the improvement comprising

ice transfer means positioned between said transfer position and said baffle means for receiving ice pieces at said transfer position and advancing said ice pieces to said dispensing position, said ice transfer means comprising means for orienting substantially all of the received elongated ice pieces such that their length extends generally parallel to said baffle means and in a generally upright direction at said dispensing position, whereby said ice pieces are caused to fall freely and rapidly over said baffle edge.

21. The method of dispensing uniform quantities of elon-

gated ice pieces from a chamber having an outlet defined by a generally upright baffle defining an upper edge, comprising the steps of:

orienting substantially all of the elongated ice pieces to extend lengthwise upwardly adjacent said baffle upper edge; and

urging the upwardly extending ice pieces to tip over said upper edge to be transferred from said chamber.

4,942,980

VENDING MACHINE

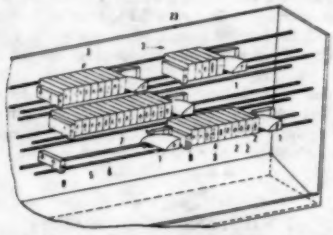
Eberhard Hellermann, Walldorf/Frankfurt, and Hans-Jürgen Welsch, Mannheim, both of Fed. Rep. of Germany, assignors to Harting Elektronik GmbH, Espelkamp, Fed. Rep. of Germany

Filed Mar. 6, 1989, Ser. No. 319,583

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1988, 3808253

Int. Cl.[5] B65G *59/00*

U.S. Cl. 221—244 **28 Claims**



1. A vending machine for dispensing packages comprising elongated support means for supporting a plurality of packages in a substantially horizontal stack, an elongated holder means spaced from said support means to define a slot between said support means and said holder means, said packages having one dimension which exceeds the width of said slot such that when said packages are oriented in one direction, said packages are supported in said stack by said support means and said holder means, said packages having another dimension which is less than the width of said slot, and dispensing means operable to engage an end package in said stack and to tip said end package to thereby orient said other dimension of said package to face said slot so that the package passes through said slot and is thereby dispensed through said slot, said dispensing means having a first position juxtaposed to said end package to be dispensed and a second position juxtaposed to the next succeeding package in said stack, said dispensing means having an upper spring means and a lower spring means, drive means being provided to effect relative movement between said dispensing means and said stack from said first position to said second position, said upper spring means and said lower spring means being operable during said relative movement from said first position to said second position to effect said tipping of said end package, said lower spring means engaging and raising said end package relative to said support means during said relative movement from said first to said second position.

4,942,981

TUBE FOR THE DISTRIBUTION OF A PASTE WITH STRIPES COMPRISING A ONE-PIECE HEAD WITH A DOUBLE SKIRT

Bernard Schneider, Sainte Menehould, France, assignor to Cebal, Clichy, France

Filed Oct. 28, 1988, Ser. No. 263,907

Claims priority, application France, Nov. 3, 1987, 87 16037

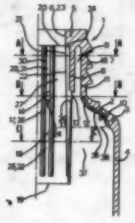
Int. Cl.[5] B65D *35/00*

U.S. Cl. 222—94 **19 Claims**

1. A tube for dispensing a paste with stripes comprising a body portion connected to a head portion, both portions made at least in part of plastic material,

the head portion being of unitary construction and comprising a neck portion connected to a shoulder portion comprising a slightly inclined inner annular surface by which said head portion is connected to said body portion;

said head portion comprising an annular outer skirt and an annular inner skirt connected together by a top portion at the top end of said neck portion and defining an annular gap therebetween in said neck portion which gap is closed by said top portion, the interior of said inner skirt being open at the top end of said neck portion and defining a discharge duct and orifice for said tube,



said inner skirt including a plurality of flow openings therein, disposed at least in part above a notional extension of said inclined inner annular surface but below said top portion to thereby define a reservoir in said annular gap between said flow openings and said top portion, and a plurality of pairs of inner longitudinal ribs, a flow opening being disposed between each said pair of ribs, said pairs of ribs extending from the vicinity of the top of said neck portion, to said flow openings to guide paste being dispensed and from said flow openings to the lower third portion of said inner skirt, to brake paste being dispensed.

4,942,982

SILO CLEANING APPARATUS

Wesley D. Hartwigsen, Box 1461; Alan D. Johnson, 2616 Wind River Dr.; Jeffrey C. Beckham, 709 Granite St., and Kenneth L. White, 3233 Watsabaugh St., all of, Gillette, Wyo. 82716

Division of Ser. No. 928,090, Nov. 7, 1986, Pat. No. 4,764,221. This application Jan. 28, 1988, Ser. No. 149,338

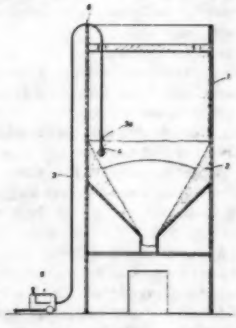
Int. Cl.[5] B65G *69/06*

U.S. Cl. 222—195 **9 Claims**

1. An apparatus for removing cohesive masses of particles adhering to the internal walls of a silo, comprising:

a mace;

means for suspending the mace from the top of the silo in a pendulous manner, and in a vertically adjustable manner to place the mace within striking range of the cohesive masses;



means for supplying pressurized gas to the mace for discharge from the mace; and

at least one laterally disposed discharge port on the mace for propelling the mace with a lateral force by discharging the supplied pressurized gas in a direction substantially normal to the axis defined by the suspended mace, propelling

the mace in a manner to randomly strike and break up the cohesive masses within the silo.

4,942,983

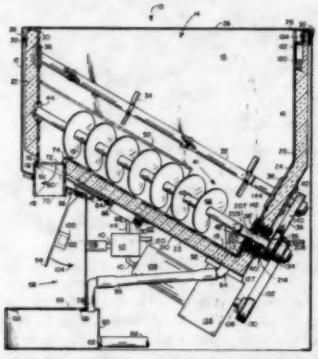
APPARATUS FOR STORING AND DISPENSING PARTICULATE ICE

John R. Bradbury, 6111 Quail Feather La., San Antonio, Tex. 78233

Continuation of Ser. No. 944,845, Dec. 18, 1986, abandoned. This application Oct. 31, 1988, Ser. No. 266,309

Int. Cl.[5] G01F *11/20*

U.S. Cl. 222—238 **7 Claims**



1. An apparatus for storing and dispensing particulate ice comprising:

an ice hopper for storage of particulate ice, said ice hopper further comprising a sloped floor;

a selectively actuable means for moving particulate ice contained within said ice hopper upwardly along said sloped floor from the lower end of said sloped floor to the upper end thereof, which ice-moving means has an axis of movement and is adapted to move particulate ice in a direction parallel to said axis of movement;

a first axial means for agitation ice contained within said hopper, which first agitating means is rotatably mounted within said hopper in an orientation having the axis of said first agitating means approximately parallel to said axis of movement of said ice moving means;

an opening in said ice hopper for dispensing particulate ice from said ice hopper, which opening is positioned to receive ice moved by said ice-moving means; and

packing means mounted in a wall of said hopper, said first agitating means having a shaft along its axis which is rotatably mounted in said packing means, said packing means further comprising:

a packing case mounted in said wall and having a hole therethrough for receiving the shaft of said first agitating means;

a thrust bearing mounted in said wall and having a hole therethrough for receiving the shaft of said first agitating means; and

a seal cap received within said hole in said packing case, said seal cap being provided with a means for sealing said seal cap against said shaft of said first agitating means and a means for sealing said seal cap against said packing case.

4,942,984

DRIPLESS SOLDER PASTE DISPENSER

Kenneth L. Miller, Indianapolis, Ind., assignor to SCM Metal Products, Inc., Cleveland, Ohio

Filed Nov. 10, 1988, Ser. No. 269,872

Int. Cl.[5] G01F *11/06*

U.S. Cl. 222—309 **5 Claims**

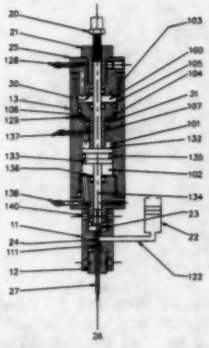
1. A dispensing device comprising: a housing containing upper, middle and lower pressure chambers, each of said chambers being pressurizable;

an upper piston separating the upper and middle pressure chambers, the upper piston having a head and a stem, the cross-sectional dimension of the head being larger than that of the stem and essentially conforming to the inside dimension of the upper pressure chamber, the stem of said upper piston being coincident with the upper surface of the middle chamber;

a lower piston reciprocatably positioned between the middle and lower pressure chambers, the lower piston being such that pressurization of the lower pressure chamber exerts upward pressure on the lower piston, and pressurization of the middle pressure chamber exerts downward pressure on the lower piston;

a reciprocating rod fixedly attached to the lower piston;

a dispensing rod tip attached to the reciprocating rod so as to reciprocate among an upward position, a downward position and an intermediate position with reciprocation of the lower piston and reciprocating rod;



a dispensing tube having a tube opening through which a dispensible semi-solid material may be introduced, the dispensing rod tip being slidably situated within the lumen of the dispensing tube and spacially related to the tube opening such that said tube opening is non-occluded when the dispensing rod tip is in the upward position, thereby allowing the dispensbile semi-solid material to be introduced into the dispensing tube, and said tube opening is occluded when the dispensing rod tip is in the downward position and the intermediate position, the dispensing rod tip being spacially related to the dispensing tube such that when the dispensing tube contains the dispensible material and the dispensing rod tip moves from its downward position to its intermediate position, negative pressure is exerted on the dispensible material causing the material to be snugged back into the dispensing tube

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4,942,985

360 DEGREE VALVE FOR ATOMIZING PUMP DISPENSER

Robert S. Schultz, Old Greenwich, Conn., assignor to Emson Research Inc., Bridgeport, Conn.

Filed Feb. 2, 1989, Ser. No. 305,288

Int. Cl.[5] B67D *5/40*

U.S. Cl. 222—376 **6 Claims**

1. A 360° valve body for use with a dispenser comprising:

(a) a lower section of generally cylindrical shape containing therein a central first bore for accepting a dip tube and having a top;

(b) an upper section of generally cylindrical shape but of smaller diameter than said lower section extending from

said top, said upper section having a central second bore therein, said first bore and said second bore having a common axis, said upper section adapted to be inserted into a dispenser

(c) a third bore in the top of said lower section adjacent said upper section and extending to said first bore in said lower section and having therein a seat for a ball check valve;

(d) an arcuate recess formed in a portion of said upper section adjacent said third bore for guiding a ball at one point;

(e) first and second posts, each having an arcuate inner surface, spaced from each other and said arcuate recess for guiding said ball at two other points;

(f) projections on said first and second posts to aid in retaining a ball in place above said seat; and

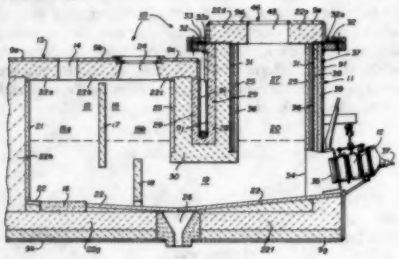
(g) a partially annular wall partially surrounding said upper section, said wall having first and second ends adjacent and spaced from said posts.

4,942,986

PRESSURIZED TUNDISH FOR CONTROLLING A CONTINUOUS FLOW OF MOLTEN METAL

Thomas W. Lewis, 964 Cork Dr., Bethel Park, Pa. 15102; Paul E. Hamill, Jr., R.D. #1, Box 173A1, Jeannette, Pa. 15644; Mustafa R. Ozgu, 790 Yorkshire Rd., Bethlehem, Pa. 18017; Ralph C. Padfield, 1918 Paul Ave., Bethlehem, Pa. 18018; Donovan N. Rego, 1703 W. Brown St., Allentown, Pa. 18104, and Guido P. Brita, 3225 Edna Terrace Ave., Bethlehem, Pa. 18017

Filed Jul. 13, 1988, Ser. No. 218,823
Int. Cl.[5] C21B *3/00*
U.S. Cl. 222—590 **12 Claims**



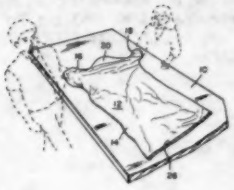
1. A tundish having a first main unpressurized chamber means for receiving molten metal in discrete increments and a second pressurized chamber means in fluid flow communication with said first chamber means for receiving molten metal from said first chamber means on a continuous basis, said second chamber means comprising a metallic box having a flanged cover, a pair of "O" rings at the flange of said flanged cover, and means for controllably introducing a pressurized inert gas into said metallic box.

4,942,987

METHOD OF FOLDING STERILE SURGICAL GARMENTS BEFORE AND AFTER STERILIZATION

Mildred K. Stackhouse, Manhattan Beach, Calif., assignor to Stack Holding Inc., Riverside, Calif.

Filed Mar. 27, 1989, Ser. No. 329,188
Int. Cl.[5] A41D *13/00*
U.S. Cl. 223—37 **3 Claims**



1. A method of folding a surgical gown into a complete package having a hood portion, sleeve portions cuff portion, hem portions, head portion, and an open end comprising the steps of:

placing the gown on a flat surface with the obverse side exposed;

extending the hood portion and the sleeve portions out from the body of the gown so the garment is flat;

pulling the cuff portion of each sleeve up to the shoulder portion thereby folding each sleeve in half and inside out;

gathering the hem portion and folding the gown in half by bringing the hem portion to the shoulder portion thereby leaving half the gown folded inside out with the head portion exposed and the gown substantially flat and in the form of a square;

separating the bottommost portion of the gown and folding the open end of each half sleeve within the folded gown and locating the open end along the edge of the square opposite the head portion;

attaching a pull tab on each sleeve portion within the square and approximately 2 inches from the end of the opening in the sleeve;

folding the head portion within the square;

attaching a single pull tab to the outside portion of the square between each sleeve portions and approximately 4 inches from the bottom of the square;

folding and completely wrapping the gown and inserting the wrapped gown into a sealed plastic container; and

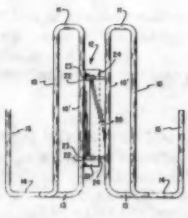
then sterilizing the complete package.

4,942,988

DEVICE TO AID IN PUTTING ON ELASTIC HOSE

Daryl E. Doorenbos, R.R. 2, Box 85A, LeMars, Iowa 51031

Filed Apr. 3, 1989, Ser. No. 332,486
Int. Cl.[5] A47J *51/06*
U.S. Cl. 223—111 **6 Claims**



1. An expanding device for stretching elastic members to ease putting such members onto the user comprising a pair of elongated frames adapted to receive said elastic members, the

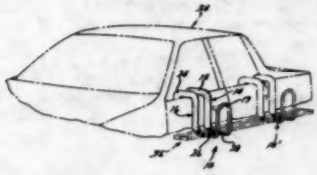
elongation of said frames being in a direction longitudinal of said device, hinge means affixed to each frame of said pair and hinged together on a longitudinal axis whereby said frames can be pivoted toward and away from each other, said hinge means being formed to releasably lock against pivotal action when said frames are in an open position away from each other, and extended handle means on each frame of said pair, said handles being adapted to provide leverage by which said frames can be moved away from each other to said open position.

4,942,989

DEVICE FOR CARRYING LUMBER AND THE LIKE

Kevin W. Miller, Southfield, Mich., assignor to Jupiter Products, Inc., Centerline, Mich.

Filed Jun. 26, 1989, Ser. No. 372,421
Int. Cl.[5] B60R 9/00
U.S. Cl. 224—42.45 R **15 Claims**



1. A lightweight device adapted for manual mounting and detachment, for carrying elongated articles along an outside surface of an automotive vehicle or the like, said device comprising:

a first S-shaped member having first and second oppositely facing U-shaped loops sharing a common arm;

a second S-shaped member having third and fourth oppositely facing U-shaped loops sharing a common arm;

an intermediate member connecting the first and second S-shaped members together, said intermediate member being of sufficient length and rigidity to maintain said first and second S-shaped members in substantially adjacent and parallel relationship to each other while being spaced apart from each other by a sufficient distance to provide lateral stability when the device is mounted on the vehicle, said first, second and intermediate members being shaped from a one-piece continuous length of tubing; and

whereby the first and third loops are adapted to be hooked over a first part of the vehicle, with the second and fourth loops serving to support one end of the elongated articles along the outside surface of the vehicle in cooperation with another substantially similar device, adapted to be hooked over a second part of the vehicle, which supports a second end of the articles.

4,942,990

CONTRACTORS' CADDY

Wood G. White, 18605 Center St., Castro Valley, Calif. 94546

Filed Jun. 1, 1987, Ser. No. 56,960
Int. Cl.[5] B60R 7/00
U.S. Cl. 224—42.42 **8 Claims**

1. A contractor's caddy system for use in cooperation with a truck having a floorboard at a floorboard area and a front seat to the rear of and above said floorboard area, comprising:

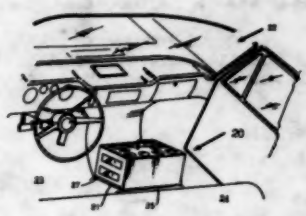
a caddy having a box-like structure with a bottom wall, vertical walls providing front, rear, and side walls, and a flat top wall, with a handle-aligning opening parallel to said front wall and centered between said front and rear walls, and centered between said side walls,

a caddy retainer comprising a base plate with first and second opposed ends, each one of said first and second opposed ends having an upwardly extending peripheral flange,

said caddy being sized to fit detachably on said base plate of said caddy retainer by biasing outwardly said flanges of said caddy retainer to provide a frictional fit between said caddy and said caddy retainer,

said caddy retainer having securing means for firmly securing said caddy retainer to said truck over said floorboard area, to locate said caddy forward of and lower than the front seat at a location readily accessible to the driver, said securing means holding said caddy retainer stationary with respect to said floorboard,

a handle slidably secured to said box-like structure of said caddy and extending through said handle-aligning opening, said handle serving for carrying said caddy when said caddy is separated from said caddy retainer, said handle being located by said handle aligning opening to be centrally between said front and rear walls and centrally between said side walls, and parallel to said front wall, said handle sliding up and down said handle-aligning opening for freely and readily collapsing vertically down from said flat top wall into said caddy, to a position substantially flush with said flat top wall, for storage, and sliding upwardly by being pulled to a second position projecting vertically upwardly for carrying said caddy,



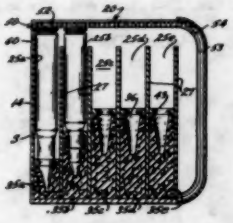
said caddy being recessed down from said top wall and shaped to provide a series of vertical compartments and receptacles, including some deep compartments and receptacles that extend down substantially nearly to said bottom wall and some compartments and recesses that are shallow and are spaced above said bottom wall.

4,942,991

AMMUNITION CONTAINER

Robert M. Lyons, 511 W. 3rd St., Reno, Nev. 89503

Filed Oct. 30, 1989, Ser. No. 429,039
Int. Cl.[5] B65D 83/02
U.S. Cl. 224—196 **16 Claims**



1. A portable ammunition container comprising a housing, said housing having an opening formed in the upper end thereof and having opposing side walls and front and rear end walls, a bottom wall joined to said opposing side walls and said front and rear end walls, a plurality of chambers formed within said housing, each of said chambers being spaced with respect to one another by at least one partition means, a resilient foam support pad means provided within each of said chambers,

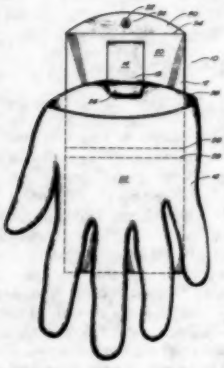
each of said pad means extending from adjacent said bottom wall of said housing upwardly toward and in spaced relationship with respect to the opening therein, a recess formed in each of said pad means for grippingly receiving the bullet end of a round of ammunition therein, each of said pad means being compressible as a round of ammunition is inserted within said recesses therein, and a lid means carried by said housing for selectively closing the opening therein, whereby said pad means are maintained compressed through engagement between said lid means and the other opposite end of the round of ammunition.

4,942,992

GLOVE DISPENSER

Frank E. Fischer, 7500 Bellerive #1419, Houston, Tex. 77036, and Shayne A. Kelly, 2502 Long Reach, Sugarland, Tex. 77478

Filed Oct. 30, 1989, Ser. No. 428,562
Int. Cl.[5] B65D *81/00*; A45F *5/02*
U.S. Cl. 224—240 **20 Claims**



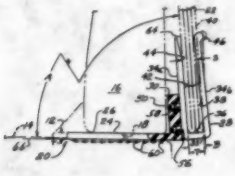
1. A glove dispenser comprising:
a case having an open position and a closed position, said case having means on one side for attachment to a belt: and
a clip within said case and fastened thereto said clip adapted for receiving the cuff of a glove.

4,942,993

VEHICLE SEAT STORAGE APPARATUS

Kenneth L. Delgado, 1318 Susan Ave., Redlands, Calif. 92374

Filed Jun. 20, 1988, Ser. No. 208,471
Int. Cl.[5] B60R *11/06*
U.S. Cl. 224—275 **13 Claims**



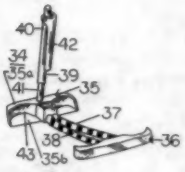
1. Apparatus for removably storing an object behind the seat of a vehicle, the seat having a seat member and a back member, an openable passage being formed between the seat member and the back member, the apparatus comprising:
(a) an anchor member for inserting forwardly into the passage from behind the seat, the anchor member having a front portion, a substantially vertically extending leg portion at the rear of the front portion, and opposite side extremities, the anchor member being supported by engagement with the passage;
(b) a support member connected to the anchor member, the support member extending rearwardly behind the seat for supporting the object;
(c) a retainer member connected to the rear of the support member and extending upwardly therefrom for removably holding the object proximate the back member; and
(d) a U-shaped member rigidly connected to the leg portion of the anchor member for receiving the object, the U-shaped member having a base member and a pair of upstanding leg members, one of the leg members forming the retainer member, the base member forming the support member.

4,942,994

SKI BOOT HOLDER

Lawrence D. Sterenberg, R.R. #4 P.O. Box 325, Marshall, Ill. 62441

Filed Aug. 15, 1988, Ser. No. 232,279
Int. Cl.[5] A45F *5/00*
U.S. Cl. 224—247 **10 Claims**



1. In a boot carrier for ski boots, said ski boots being a right and left boot, each of said boots having:
a. a heel and a toe,
b. a flat rigid sole,
c. a toe notch across the toe for ski bindings, and
d. a heel notch across the heel for ski bindings;
wherein the improved carrier comprises:
a unitary, contoured heel frame adapted to fit closely around the backs of both of the heels of a pair of ski boots, said heel frame including contoured cavities generally conforming to the respective back portions of the heels of a pair of ski boots when placed side-by-side in a normally upright position with the backs of the heels nesting in said heel frame flexible tensioning means extending from said contoured heel frame for retaining said ski boots received in said heel frame; and a support means comprising a rod-like, rigid member extending from the mid portion of said contoured heel frame at a small angle from the vertical, toward the front of said boots for supporting the heel frame and ski boots for supporting the heel frame and ski boots received in said heel frame.

4,942,995

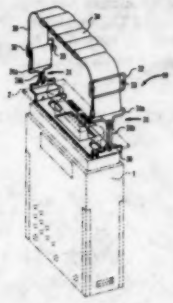
CAR RADIO HOLSTER

Errol Myers, 190 Palmetto St., Brooklyn, N.Y. 11221

Filed Aug. 31, 1989, Ser. No. 401,042
Int. Cl.[5] A45F *3/14*
U.S. Cl. 224—258 **3 Claims**

1. A device for carrying a vehicle radio comprising a frame member fixedly attachable to said radio, and a shoulder strap selectively attachable to said frame member, said frame member being formed in a manner to be fitted about the periphery of the forepart of said radio, said frame member comprising a substantially C-shaped member including a main body portion and reversed-Z-shaped arms extending from each end of said

main body portion, said main body portion including a centrally disposed rectangular opening for receipt of the face of said radio and elliptical openings formed to each side of said



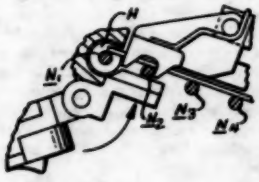
rectangular opening for receipt of the knob spindles of said radio, said arms having openings formed in the distal leg of said Z-shaped member providing means for attachment of said shoulder strap.

4,942,996

FASTENER-DRIVING TOOL

Robert L. Wolfberg, Buffalo Grove; Rudolph A. M. Golsch, Arlington Heights, and Frank C. Howard, Mount Prospect, all of, assignors to Illinois Tool Works, Inc., Chicago, Ill.

Filed Sep. 23, 1988, Ser. No. 248,185
Int. Cl.[5] B25C *1/04*
U.S. Cl. 227—136 **4 Claims**



1. A fastener-driving tool comprising:

(a) a housing structure having a nosepiece defining a drive track adapted to receive a fastener and to guide the fastener as the fastener is driven from the driver track;

(b) a magazine mounted to the housing structure in spaced relation to the drive track and adapted to store a strip of collated fasteners so that a leading portion of the strip extends from the magazine toward the drive track; and

(c) a nail-feeding mechanism mounted operatively to the housing structure, the nail-feeding mechanism including:

(1) means for feeding fasteners individually and sequentially into the drive track from the leading portion of a given strip of collated fasteners thus stored by the magazine, said means including a fastener-feeding element having at least one groove adapted to receive one such fastener;

(2) a fixed structure fixed to the housing structure and adapted to confine one of two sides of the leading portion of the given strip so as to guide the leading portion of the given strip along fastener-guiding surfaces of the fixed structure as fasteners from the leading portion of the given strip are thus fed;

(3) a hinged structure hinged to the nosepiece and adapted when disposed in an operative position to confine the other side of the leading portion of the given strip so as to guide the leading portion of the given strip along fastener-guiding surfaces of the hinged structure as fasteners from the leading portion of the given strip are thus fed, the hinged structure including:

(i) a holding member hinged to the nosepiece, adapted when disposed in an operative position to hold one such fastener in the groove of the fastener-feeding element, and adapted to be hingedly moved to inoperative positions so as to expose said groove, any such fastener in said groove, and any such fastener in the drive track; and

(ii) a hinged cover hinged to the nosepiece, adapted when disposed in an operative position to secure the holding member in the operative position of the holding member, as the sole means for securing the holding member in the operative position of the holding member, and adapted to be hingedly moved to inoperative positions so as to allow the holding member to be hingedly moved to inoperative positions of the holding member, and so as to expose fastener-guiding surfaces of the fixed structure, any fasteners between the magazine and the fastener-feeding element, and any fastener in the drive track; and

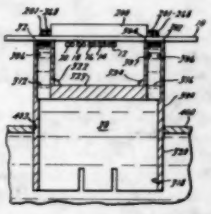
(4) means for securing the hinged cover releasably in the operative position of the hinged cover with the holding member in the operative position of the holding member.

4,942,997

SOLDER FLOW WELL FOR REFLOWING SOLDER OF MULTIPIN COMPONENTS

Peter J. Sinkunas, Canton; Rodney L. Ritter, Woodhaven, and James E. Altpeter, Canton, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 3, 1987, Ser. No. 92,799
Int. Cl.[5] B23K *3/00*
U.S. Cl. 228—56.1 **5 Claims**



1. A solder well for use in the desoldering and removing of a multi-terminal electrical component from its soldered connection to a printed circuit board, comprising:

a closed outer wall having inner and outer surfaces and configured to have an upper edge that lies in a generally horizontal plane;

a closed inner wall having a first surface that opposes said inner surface of said closed outer wall to define a molten solder receiving channel and configured to have an upper surface that lies in a plane generally coplanar with the upper edge of said closed outer wall;

said solder receiving channel is defined by said closed outer and inner walls to correspond to the pattern of the multipin terminal connections to the printed circuit board; and

said closed inner wall also has a second closed surface that defines a cup to receive excess solder from said channel and a means for draining the cup.

4,942,998

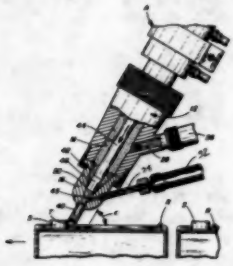
APPARATUS AND PROCESS FOR AUTOMATICALLY DISPENSING METAL ALLOY PASTE MATERIAL FOR JOINING METAL COMPONENTS

Bruce B. Horvath, 1831 E. 291st St., Wickliffe, Ohio 44092; Raymond A. Hurlbut, 34910 Dixon Rd., Willoughby Hills, Ohio 44094; A. Thomas DiFranco, 6760 Stafford Dr., Mayfield Hts., Ohio 44124, and Bruce R. Williams, 13278 Green Dr., Chesterland, Ohio 44026

Continuation of Ser. No. 285,284, Dec. 15, 1988, abandoned, which is a continuation of Ser. No. 165,440, Feb. 29, 1988, abandoned, which is a continuation of Ser. No. 54,142, May 12, 1987, abandoned, which is a continuation of Ser. No. 893,485, Aug. 7, 1986, abandoned, which is a continuation of Ser. No. 788,661, Oct. 17, 1985, abandoned, which is a continuation of Ser. No. 532,998, Sep. 19, 1983, abandoned. This application Aug. 9, 1989, Ser. No. 393,078

Int. Cl.[5] B23K *3/06*

U.S. Cl. 228—102 3 Claims



1. A process for joining a first metal component to a second metal component by means of a soft-solder alloy paste composition, the process comprising the steps of continuously moving said first metal component relative to a paste applicator station including an applicator gun means having an ejector nozzle, automatically controlling movement of said first metal component relative to said ejector nozzle, delivering a predetermined quantity of said alloy paste composition from said applicator gun means to and through said ejector nozzle, applying a predetermined pneumatic pulse into said nozzle in timed sequence with movement of said paste composition for shearing said paste composition to provide a predetermined discrete paste increment unit substantially simultaneously ejecting said increment unit axially from said ejector nozzle onto a predetermined area of said first metal component, said discrete unit of paste material is ejected from said applicator gun means by a distance at least as great as the maximum transverse dimension of the paste deposit resulting from disposition of the said paste unit increment, and said paste material has a viscosity, at ambient temperature, in the range between 150,000 and 500,000 cantipories, and wherein said pneumatic pressure is automatically controlled so as to deliver a pressure between 15 psi to 30 psi, moving said second metal component into engagement with said first metal component with said paste increment unit disposed in the joint area to provide a solder joint, heating said solder joint to physically join said components together, and cooling said joint to provide a metal-to-metal solder joint.

4,942,999

METAL-CERAMIC JOINED COMPOSITE BODIES AND JOINING PROCESS THEREFOR

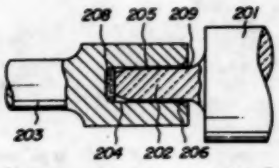
Isao Oda; Takao Soma, both of Nagoya; Nobuo Tsuno, Kasugai; Takashi Ando, and Yoshizumi Nakasuji, both of Nagoya, all of Japan, assignors to NGK Insulators, Inc., Japan

Filed Aug. 25, 1988, Ser. No. 236,145

Claims priority, application Japan, Aug. 31, 1987, 62-215187; Dec. 11, 1987, 62-311836; Mar. 22, 1988, 63-65864; Jun. 3, 1988, 63-135721

Int. Cl.[5] B23K *1/19, 103/16*

U.S. Cl. 228—124 18 Claims



1. A metal-ceramic joined composite body comprising a ceramic member having a projection formed thereon, at least a portion of said projection having a constant outer diameter, and a metallic member having a recess formed therein, at least a portion of said recess having a constant inner diameter, corresponding to that portion of the projection having a constant outer diameter, said projection being inserted and joined into said recess such that an outer peripheral surface of the projection is integrally joined to an inner peripheral surface of the recess by brazing substantially only at that portion of the projection having a constant outer diameter and that portion of the recess having a constant inner diameter, wherein said joining between the metallic member and the ceramic member is substantially limited to the joining between the outer peripheral surface of the projection and the inner peripheral surface of the metallic member by providing a thin layer made of a material not joinable to a brazing metal onto a surface of a tip end of the projection and interposing a low elasticity intermediate member of a material not joinable to a brazing metal between the surface of the tip end of the projection and the bottom surface of the recess.

4,943,000

METHOD OF BRAZING ALUMINUM ALLOYS WITHOUT FILLER METAL

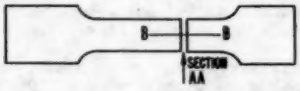
Guy-Michel Raynaud, Saint Egreve; Louis Realis, Charavines, and Didier Constant, Saint Egreve, all of France, assignors to Cegedur Societe de Transformation de L'Aluminum Pechiney, Paris, France

Filed Dec. 16, 1987, Ser. No. 133,883

Claims priority, application France, Dec. 16, 1986, 86 18454

Int. Cl.[5] B23K *20/00*

U.S. Cl. 228—193 9 Claims



1. Method of brazing without filler metal of two components of which at least one is of Al alloy, comprising the steps of;

(a) before brazing, maintaining a component of Al alloy in a region of temperatures included between the temperature of solvus of said Al alloy and 2/5 of the temperature of fusion of said Al alloy expressed in °Kelvin, for a time

greater than or equal to the time minimum of one of the TTP curves of said Al alloy, P being either a mechanical characteristic, or the sensitivity to corrosion; and

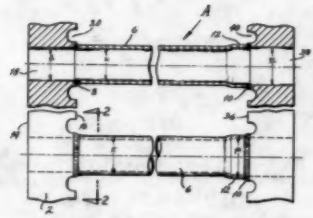
(b) assembling said components and brazing in a region of temperatures included between the temperature of the most fusible eutectic corresponding to the equilibrium diagram of the constituents of the Al alloy and that of solidus of said Al alloy.

4,943,001

TUBE-TYPE VESSEL HAVING CREVICE-FREE JOINTS AND METHOD FOR MANUFACTURING THE SAME

John J. Meyer, St. Louis, Mo., assignor to Nooter Corporation, St. Louis, Mo.

Filed Jul. 7, 1987, Ser. No. 70,570
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—173.4 **11 Claims**



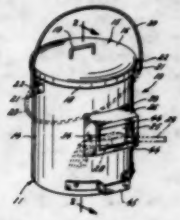
1. A process for manufacturing a tube-type vessel, said process comprising: providing a first tubesheet having front and back faces and first bores extended generally between those faces as well as first sockets arranged such that the first bores open out of the back face through the first sockets; providing a second tubesheet having first and second faces and second bores extending generally between those faces as well as second sockets arranged such that the second bores open out of the back face through the second sockets, the diameter of the second bores being greater than the diameter of the first bores and the diameter of the second sockets being greater than the diameter of the first sockets; positioning the tubesheets with their back faces presented toward each other and with their bores aligned, so that for each first bore in the first tubesheet, a corresponding second bore in the second tubesheet aligns with it, with the sockets at the ends of those bores being presented toward each other; inserting a separate tube axially through each second bore in the second tubesheet and bringing its leading end into the socket at the end of the corresponding first bore in the first tubesheet, the tube having an outside diameter that is greater than the diameter of the first bore but less than the diameter of the first socket at the end of the first bore and also less than the diameter of the second bore; while the leading end of the tube is in the first socket, welding that end of the tube to the back face of the first tubesheet around the first bore with which it is aligned; expanding the trailing end of the tube into the second socket at the end of the second bore through which the tube was inserted, so as to produce an enlarged end portion having an outside diameter that is larger than the diameter of the second bore; and while the trailing end of the tube is in the second socket, welding that end of the tube to the back face of the second tubesheet around the second bore with which the tube aligns.

4,943,002

ASH CONTAINER

Daniel Fraher, P.O. Box 141, Aroma Park, Ill. 60910

Filed May 18, 1989, Ser. No. 353,885
Int. Cl.[5] B65D *91/00*
U.S. Cl. 232—43.1 **18 Claims**



1. An ash container comprising

a receptacle having a bottom wall and a side wall defining an open top,

a removeable cover for closing the open top of said receptacle, a collar extending outwardly from one side of said side wall intermediate said bottom wall and the top of said receptacle defining a side entrance opening to said receptacle,

said side wall having a lower uninterrupted portion below said entrance opening and a upper uninterrupted portion above said entrance opening,

said bottom wall and said lower uninterrupted portion of said side wall defining an ash accumulation zone below said entrance opening for containing ash deposited into said receptacle through said entrance opening, and

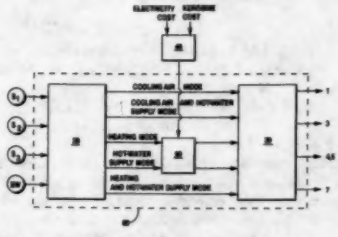
said cover and said upper uninterrupted portion of said side wall defining a dust reflection and redirection zone above said entrance opening for confining and redirecting downwardly into said accumulation zone dust from ash deposited into said receptacle through said entrance opening.

4,943,003

CONTROL DEVICE FOR HEAT PUMP WITH HOT-WATER SUPPLY FACILITY

Mitsuo Shimizu; Kazuo Maehara; Hidenobu Shinohara, and Hideo Kojima, all of Isesaki, Japan, assignors to Sanden Corporation, Isesaki, Japan

Filed Feb. 15, 1989, Ser. No. 310,386
Claims priority, application Japan, Feb. 15, 1988, 63-32470
Int. Cl.[5] G05B *13/02*
U.S. Cl. 237—2 B **1 Claim**



1. A control device for a heat pump system having a hot-water supply facility and including a heat pump, a boiler and a hot-water supply tank comprising:

input means for inputting the cost of electricity for operating

the heat pump and for inputting the cost of fuel for operating the boiler;

first sensor means for detecting the temperature of the ambient air;

second sensor means for detecting the moisture of the ambient air;

third sensor means for detecting the temperature of the hot-water supply;

operation means for selecting an operational mode in accordance with output signals from said sensor means;

comparison means for selecting the cheaper energy cost on the basis of cost data received from said input means in the heating air mode and in the hot-water supply mode; and

control circuit means for operating either the heat pump or the boiler based on the result of the comparison performed by said comparison means.

4,943,004

ACTUATOR FOR A FUEL INJECTOR

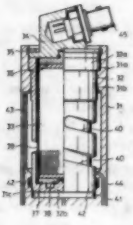
Takeshi Takahashi, Mishima, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 9, 1988, Ser. No. 281,769

Claims priority, application Japan, Dec. 29, 1987, 62-335260

Int. Cl.[5] H01L *41/08*

U.S. Cl. 239—95 **26 Claims**



1. An actuator for a fuel injector, comprising:

an actuator housing having a cylinder bore formed therein;

a hollow cylindrical spring member, one end of which is supported by the actuator housing and another end of which forms a piston slidably inserted into the cylinder bore and defining a cylinder chamber in the cylinder bore, said spring member including a first surface, said cylinder bore including a second surface, said first and second surfaces engaging one another and preventing said one end of the cylindrical spring member from moving toward said another end; and

a piezoelectric element inserted into the hollow cylindrical spring member and supported between the actuator housing and the other end of the hollow cylindrical spring member.

4,943,005

ROTARY ATOMIZING DEVICE

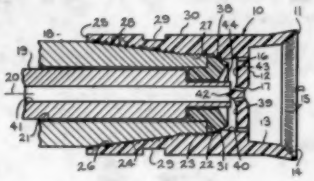
Richard Weinstein, Toledo, Ohio, assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed Jul. 26, 1989, Ser. No. 385,734

Int. Cl.[5] B05B *3/10*

U.S. Cl. 239—223 **7 Claims**

1. A rotary paint atomizing device for attachment to a free end of a rotatable tubular drive shaft having an axial passage with a paint feed tube extending coaxially therethrough, said device having an axis of rotation with first and second ends on said axis, said first end of said device forming an opening for receiving said drive shaft end, means in said opening for removably attaching said device to said drive shaft end to retain said device coaxially on said drive shaft end, a surface at said second end for receiving paint and delivering a flowing film of such paint to a paint discharge edge, a front wall separating said first and second ends, said wall having an interior surface forming a forward wall portion of a paint receiving chamber, a plurality of passages through said wall for distributing paint from said chamber onto said surface as said device is rotated by said drive shaft, said device being characterized by an annular



insert positioned coaxially with said shaft and said device and clamped between said drive shaft end and said device, said insert having an axial opening, said insert forming a removable rear wall portion of said paint receiving chamber for providing access to said chamber, and wherein said paint feed tube extends coaxially into said insert opening.

4,943,006

RAIL FASTENING MEANS

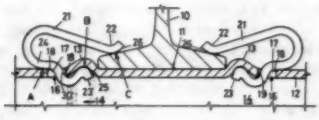
Jack Clark, and Norman K. Geddes, both of Adelaide, Australia, assignors to BHP Rail Products, Inc., Melbourne, Australia

Continuation of Ser. No. 398,207, Jul. 14, 1982, abandoned. This application Jul. 3, 1985, Ser. No. 752,476

Claims priority, application Australia, Jan. 25, 1982, 2427

Int. Cl.[5] E01B *9/48*

U.S. Cl. 238—349 **13 Claims**



1. A combination of a rail sleeper and fastening clip for fastening the foot of a rail to the sleeper comprising:

a sleeper having an upper and lower surface;

at least one protuberance formed in the sleeper and defining on the upper surface of the sleeper an upstanding rail seat for supporting and retaining a rail for gauge and defining on the lower surface of the sleeper a concave clip retaining recess;

at least one clip aperture formed through the sleeper adjacent to the protuberance and opposite the rail seat;

at least one fastening clip of a general U-shaped configuration having an upper toe, a heel and a lower toe and adapted to resiliently lock through the clip aperture such that the upper toe bears downwardly on the rail foot, the heel bears downwardly on the upper surface of the sleeper and the lower toe bears upwardly against the clip retaining recess; and

the lower toe of the fastening clip being formed of a concave portion adjacent the heel which extends through the clip aperture and beneath the lower surface of the sleeper and terminating in a convex portion which is complementary to and bears against the clip retaining recess.

4,943,007

SPRAY GENERATORS

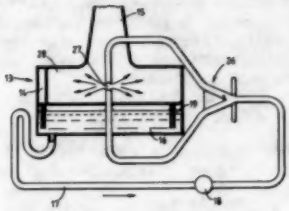
Michael J. Bowe, New Longton, and Stuart A. Clark, Hoghton, both of United Kingdom, assignors to United Kingdom Atomic Energy Authority, England

Filed Mar. 3, 1989, Ser. No. 319,253

Claims priority, application United Kingdom, Mar. 4, 1988, 8805151; May 25, 1988, 8812394; Dec. 2, 1988, 8828332

Int. Cl.[5] B01D *53/18*; B05B *1/10, 12/00*

U.S. Cl. 239—405 13 Claims



1. A spray generator for producing a spray of droplets of narrow size spectrum comprising a pair of spaced-apart nozzles disposed such that liquid flows issuing therefrom impinge and interact to form a spray, and means for imposing a substantially uniform cyclic disturbance on the liquid flows at the nozzles, which nozzles are located in a vortex chamber, the vortex chamber having a tangential gas inlet and an axial gas outlet, the nozzles being located in a central region as viewed axially.

4,943,008

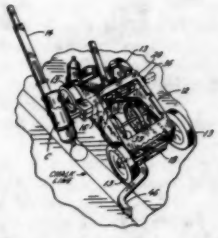
CHASSIS ASSEMBLY FOR SPRAYING APPARATUS

Thomas J. Smrt, Cary, Ill., assignor to Fox Valley Systems, Inc., Cary, Ill.

Filed Mar. 30, 1989, Ser. No. 331,267

Int. Cl.[5] B05B *1/28, 9/04*; E01C *23/16*

U.S. Cl. 239—754 11 Claims



1. A movable spraying apparatus for marking a surface over which the apparatus moves, said apparatus comprising:

chassis means for supporting a container which contains material which the apparatus discharges onto the surface to make a mark, said chassis means comprising: a housing and a beam member secured to said housing, said beam member having a first segment disposed in said housing and a second segment disposed outward of said housing as a cantilever;

wheel means rotatably mounted to said chassis means for supporting said chassis means and allowing a user to move the apparatus over the surface; and

handle means adapted for being selectively and releasably secured to said first or second segment of said beam member for controlling said apparatus and the container to discharge material from the container onto the surface in a predetermined pattern.

4,943,009

PLYING OR DOUBLING MACHINE

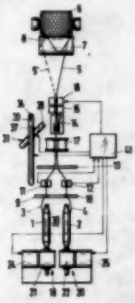
Ditmar Gerstner-Stevens, Obertshausen, and Josef Schrod, Eppertshausen, both of Fed. Rep. of Germany, assignors to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Mar. 16, 1989, Ser. No. 324,304

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808957

Int. Cl.[5] B65H *54/00, 63/024*

U.S. Cl. 242—42 9 Claims



1. A plying machine wherein at least two original threads taken from run-off spools are together wound as a doubled thread over a plying spool, comprising:

a magazine for replacing one of said run-off spools with at least one reserve spool;

thread watching means for sensing the absence of said original threads along predetermined respective paths and for providing in response thereto a watcher signal;

a common cutting means for concurrently cutting said original threads;

a combining means for binding together said original threads and said doubled thread, said combining means being positioned, at least when binding, at at least one predetermined position on the machine;

a plurality of guiding means, each having a thread grasping means, for providing said original threads and said doubled thread to said combining means; and

control means coupled to said cutting means, to said binding means and to at least one of said guiding means for automatically operating them in response to said watcher signal.

4,943,010

ACCELERATION SENSOR

Toshimasa Yamamoto, and Yuji Nishimura, both of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Sep. 22, 1988, Ser. No. 247,528

Claims priority, application Japan, Sep. 24, 1987, 62-145701[U]

Int. Cl.[5] B60R *22/40*

U.S. Cl. 242—107.4 A 16 Claims

1. An acceleration sensor comprising:

a first inertia body;

first means for holding the first inertial body so that the first inertia body can move upon being subjected acceleration of at least a predetermined magnitude;

a first lever means having a first end portion resting on said first inertia body, and a second end portion;

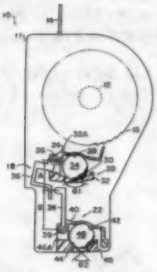
first means for mounting the first lever means so that the first

lever means can be pushed and swung by said first inertia body when said first inertia body is moved;

a second inertia body;

second means for holding the second inertia body so that the second inertia body can move upon being subjected to vertical acceleration of at least predetermined magnitude;

a second lever means having a first end portion resting on said second inertia body, and a second end portion; and



second means for mounting the second lever means so that the second lever means can be pushed and swung by said second inertia body when said second inertia body is substantially vertically moved so as to push against said second end portion of said first lever means to limit the swinging of said first lever means.

4,943,011

SEAT BELT RETRACTOR WITH TENSION-REDUCING WINDING MECHANISM

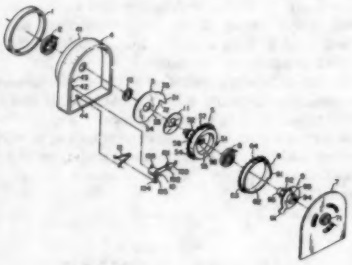
Hideo Kitamura, and Ichiro Nakagawa, both of Shiga, Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Oct. 3, 1989, Ser. No. 417,020

Claims priority, application Japan, Oct. 12, 1988, 63-254984

Int. Cl.[5] B60R *22/44*

U.S. Cl. 242—107 **5 Claims**



1. A seat belt retractor having a belt-winding mechanism that includes a belt reel shaft mounted for rotation in a frame, a toothed wheel mounted for rotation relative to the reel shaft, a main spiral winding spring connected at one end to the frame and at the other end to the toothed wheel and biasing the toothed wheel rotationally in the belt-winding direction, an auxiliary spiral winding spring connected at one end to the toothed wheel and at the other end to the reel shaft to bias the reel shaft in the belt-winding direction relative to the toothed wheel, and means for stopping rotation of the toothed wheel in the belt-winding direction to remove the bias of the main winding spring from the reel shaft including a stopper pawl engageable with the toothed wheel, characterized in that the toothed wheel has ratchet teeth engageable by the stopper pawl such as to be prevented from rotating in the belt-winding direction upon such engagement, in that an over-center spring is connected between the frame and the stopper pawl and biases the pawl toward or away from engagement with the ratchet teeth of the toothed wheel, depending on the position to which the stopper pawl is moved, and in that a clutch plate is coupled by a clutch spring to the toothed wheel and has cam surfaces engageable with a clutch control follower pin on the stopper pawl to control the position of the stopper pawl in response to winding and unwinding movements of the belt reel shaft such as to hold the pawl out of engagement with the ratchet teeth when the belt is unwound from the reel and is then allowed to partly rewind onto the reel and to enable the stopper pawl to engage the ratchet teeth and prevent rotation of the gear wheel in the belt-winding direction when the belt is pulled out such as to rotate the reel shaft in the belt-unwinding direction after such partial rewinding.

4,943,012

DOUBLE BEARING FISHING REEL

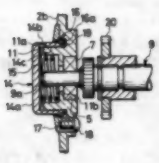
Atsuhito Aoki, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Feb. 9, 1988, Ser. No. 153,927

Claims priority, application Japan, Feb. 9, 1987, 62-18155[U]; Feb. 9, 1987, 62-18156[U]

Int. Cl.[5] A01K *89/033*

U.S. Cl. 242—290 **1 Claim**



1. A double bearinng fishing reel comprising:

(a) a reel body having two spaced-apart side frames opposite each other;

(b) a spool shaft having two end portions rotatably supporting said shaft between said side frames and being rotatable in association with the rotation of a reel handle;

(c) a cylindrical male-threaded protrusion extending laterally from one of said side frames and having a bearing hole therein for receiving one end portion of said spool shaft, said male-threaded protrusion having a first cylindrical wall coaxial with said bearing hole, and a first flange member extending radially inwardly from said first cylindrical wall;

(d) a brake adjusting screw member having a second cylindrical wall and an end wall, wherein the inner wall of said second cylindrical wall is provided with an annular groove, and further including an annular brake adjusting spring fitted in said annular groove, a protrusion extending radially outwardly from said brake adjusting spring, and a wavy surface formed on the inner peripheral surface of a recess of said one side frame so that said wavy portion is engaged with said protrusion from said annular brake adjusting spring to restrain said brake adjusting screw from being loosened and to produce click sounds when said brake adjusting screw member is turned, said second cylindrical wall being threadably engaged with said male-threaded protrusion and said end wall abutting against one end portion of said spool shaft in the axial direction when screwed onto said male-threaded protrusion;

(e) a radial protrusion extending radially outwardly from said second cylindrical wall and having an outer end surface;

(f) a retaining member affixed by fasteners to the outside of said one side frame and having a central bore with a sec-

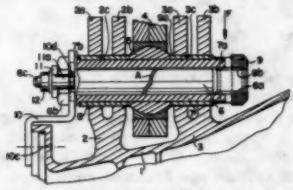
ond flange member extending radially inwardly, said second flange member having an inner surface adapted to engage with said outer end surface of said protrusion on said second cylindrical wall so as to restrain said brake adjusting screw member from inadvertently coming off said protrusion of said side frame.

4,943,013

FASTENER SYSTEM FOR A JET ENGINE MOUNTING

Patrick Kapala, Claye Souilly, and Jean-Pierre Mareix, Avon, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d-Aviation (SNECMA), Paris, France

Filed Aug. 28, 1989, Ser. No. 398,921
Claims priority, application France, Sep. 1, 1988, 88 11434
Int. Cl.[5] B64D *27/00*
U.S. Cl. 244—54 **10 Claims**



1. A fastener system for attaching a jet engine casing to a mounting bar such that the system may be attached and removed with access to only one side of the mounting bar, the system comprising:

(a) upstream and downstream flanges extending from the jet engine casing defining openings generally coincident with an opening defined by the mounting bar, the flanges being located on opposite sides of the mounting bar;

(b) a first hollow sleeve member extending through the opening defined by the downstream flange, the hollow sleeve member defining a threaded portion;

(c) a second hollow sleeve member extending through the opening defined by the upstream flange;

(d) a hollow pin member having a head portion and a shaft portion extending through the opening defined by the mounting bar and into both sleeve members;

(e) anti-rotation means interposed between the downstream hollow sleeve member and the hollow pin member to prevent relative rotation between these elements; and

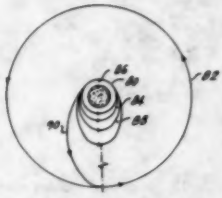
(f) bolt means extending through the hollow pin member and threadingly engaging the threaded portion of the downstream sleeve member, the bolt means having a headed portion bearing against the head portion of the hollow pin member such that tightening the bolt means urges the hollow sleeve members towards each other.

4,943,014

SOFT RIDE METHOD FOR CHANGING THE ALTITUDE OR POSITION OF A SPACECRAFT IN ORBIT

Oliver P. Harwood, Huntington Beach, and John A. Love, Seal Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 170,190, Mar. 18, 1988, abandoned, which is a continuation of Ser. No. 916,907, Dec. 8, 1986, abandoned, which is a continuation of Ser. No. 769,635, Aug. 26, 1985, abandoned, which is a division of Ser. No. 407,379, Aug. 12, 1982, Pat. No. 4,575,029, which is a continuation of Ser. No. 89,349, Oct. 30, 1979, abandoned. This application Apr. 14, 1989, Ser. No. 338,468
Int. Cl.[5] B64G *1/26, 1/10*
U.S. Cl. 244—158 R **10 Claims**



8. A soft ride method for changing the position of an orbiting satellite comprising the steps of:

selecting an orbital location for commencing a soft ride change in orbital position;

providing a relatively low acceleration thrust;

altering the velocity of said satellite; and

repeating said thrust until a desired orbital position is achieved.

4,943,015

FIXING SYSTEM ENABLING A STRUCTURE TO BE RAPIDLY DOCKED FOR SECURING THEREON AN ELEMENT IN A DETACHABLE WAY

Freddy Geyer, Cannes La Bocca; Jean P. Henry, Vallauris, and Paul Libert, Les Adrets De L'Esterel, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Aug. 1, 1989, Ser. No. 388,009
Claims priority, application France, Aug. 5, 1988, 88 10630
Int. Cl.[5] B64G *1/64, 4/00*
U.S. Cl. 244—161 **10 Claims**

1. Fixing system enabling in particular to rapidly dock a structure for securing thereon an element in a detachable way, wherein the system comprises:

pliers able to open spontaneously under the action of a first spring;

a mobile rod able to slide under the action of a second spring so as to close said pliers against the action of said first spring;

a mobile support for said second spring;

controllable locking means to lock said sliding rod and said mobile support and able to occupy three positions, namely;

a first position in which said rod and said support are locked and said second spring is compressed;

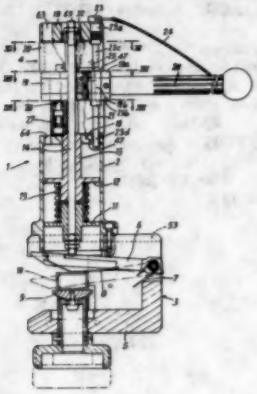
a second position in which said rod is unlocked, but said support remains locked; and

a third position in which said rod and said support are unlocked;

and means with deliberate control to block said locking means and also able to occupy three positions, namely:

a first position in which said locking means are blocked in their first position;

a second position in which said locking means can pass from their first to their second position; and



a third position in which said locking means can pass from their second to their third position.

4,943,016

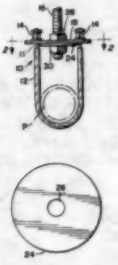
PIPE HANGER ASSEMBLY

Richard Hennecke, 1804 Dixie Dr., Waukesha, Wis. 53186

Continuation-in-part of Ser. No. 659,517, Oct. 12, 1984, abandoned. This application Apr. 4, 1986, Ser. No. 848,235

Int. Cl.[5] A47B *96/00*

U.S. Cl. 248—59 **9 Claims**



1. A universal pipe hanger assembly adapted to be suspended from a support for insulating and uniformly supporting the full under surface of a pipe or the like, comprising a substantially uniformly flat or planar washer member having a first aperture therethrough for receiving said support, said washer member comprising additional aperture means for receiving at least one end of a multistrand flexible metal cable, said washer member being adapted to be assembled in stacked relation to other similar washer members if required to add strength to said pipe hanger assembly, a flexible multistrand metal cable hugging a pipe of any size for uniformly carrying the weight of the pipe across the width of the pipe and having the opposite ends of the cable respectively received in the aperture means of said washer member, an insulating and cushioning sheath on the exterior surface of said metal cable and encasing said cable along a substantial portion of the length thereof forming an intimate contact across the full under surface of the pipe insulating and cushioning the cable from the pipe to prevent electrolytic action and abrasion, and first and second substantially identical stop sleeve members distinct from said multi-strand cable but respectively compressively secured to the respective opposite ends of said metal cable and seated on said washer member around the aperture means to retain said cable on said washer member and distribute the load carrying support over the length of the stop sleeves.

4,943,017

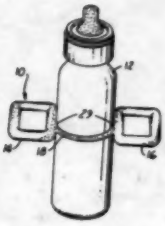
FLEXIBLE CONTAINER HOLDER WITH INTEGRAL HANDLES

John W. Ennis, 6049 Balboa Cir., #202, Boca Raton, Fla. 33433

Filed Jan. 23, 1989, Ser. No. 299,657

Int. Cl.[5] A47D *15/00*

U.S. Cl. 248—102 **5 Claims**



1. A flexible container holder having a centrally located longitudinally extending axis comprising:

a nominally ring-like central portion surrounding said axis and forming a central securing section at the inner periphery of said ring-like central portion for receiving a fluid container, said ring-like central portion being deformable out of a nominal ring shape into various other shapes to conform to the shape of the outer peripheral wall of a particular fluid container; and

flexible handle portions integrally connected to said central ring-like portion at opposite sides of said central ring-like portion and lying in a plane perpendicular to said axis, said handle portions being generally rectangular and having spaces at the inner periphery thereof to accommodate the hands of a person who wishes to hold a container with the flexible container holder, said handle portions having a circular cross-section and said ring-like central portion having a circular cross-section, the cross-section of said ring-like central section being of a smaller diameter than the cross-section of said handle portions, said central securing section being bounded over a small arc of the circumference of said ring-like central section by a portion of both of said handle portions.

4,943,018

WALL-MOUNTABLE BACK BRUSH

Gary A. Glaser, R.R. 1, Box 231, Ridgeland, Wis. 54763, and Garry S. Glaser, 5455 Smetana Dr., Apt. 1215, Minnetonka, Minn. 55343

Filed Dec. 7, 1988, Ser. No. 280,839

Int. Cl.[5] A47K *7/02*

U.S. Cl. 248—110 **9 Claims**

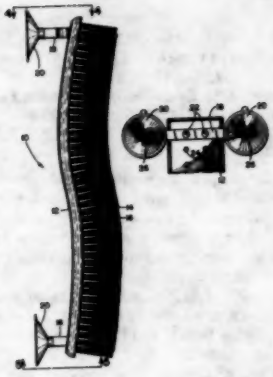
1. A wall-mountable back brush, comprising:

an elongate base having opposite sides and opposite top and bottom ends;

said base being of generally S-shaped continuous curvature between the top and bottom ends in order to fit the lumbar region;

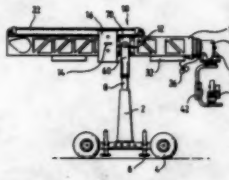
bristles secured to one side of said base;

a plurality of suction cups;
a pair of braces, one at each end of said base; and



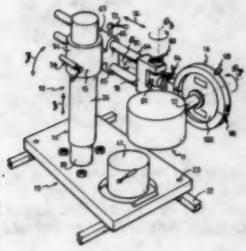
means for securing said braces to said base in adjustable, spaced apart relationship;
at least one suction cup being provided on each brace.

4,943,019
LEVELLING SYSTEM FOR CAMERA CRANES
Gyula Mester, Muenster, Fed. Rep. of Germany, assignor to Technovision Cameras Limited, England, a part interest
Filed Dec. 30, 1988, Ser. No. 292,437
Int. Cl.[5] G03B *17/00*
U.S. Cl. 248—123.1 6 Claims



6. A levelling system for use with a camera crane having a telescopic boom mounted on a horizontal pivot, the system comprising a levelling head adapted to be fitted to the boom and provided with a motor and a camera remote head mounting operatively connected to said motor to enable the mounting to be rotated about a horizontal axis, a control circuit for providing control signals to said motor, respective sensing means for direct association with a boom pivot and said motor operative to provide input signals to said control circuit, said control circuit being operative to maintain a camera remote head mounted to said mounting level during all motions of the crane.

4,943,020
MANIPULATOR APPARATUS
Louis Beaucoup; Jean Boncompain, both of Saint Etienne, and Jean-Claude Reynaud, Manosque, all of France, assignors to Schlumberger Technologies, Inc., San Jose, Calif.
Filed Sep. 9, 1988, Ser. No. 242,780
Claims priority, application France, Sep. 17, 1987, 87 13098; Sep. 17, 1987, 87 13099
Int. Cl.[5] A47G *29/00*
U.S. Cl. 248—124 11 Claims



8. A manipulator for manually positioning an object in space and maintaining the position, comprising:
a base;
a first vertical structure mounted on said base;
a second vertical structure in engagement with said first vertical structure and moveable relative thereto along a vertical axis from a fully retracted position in which the respective upper regions of said first and second vertical structures are at substantially the same level, to a fully extended position in which the upper region of said first vertical structure and the lower region of said second vertical structure are at substantially the same level;
an object support arm connected to said second vertical structure and adapted to receive said object;
an adjustable bias force generator mounted in said base and comprising:
a case attached to said base;
a drum rotatably mounted in said case and having a surface of progressively varying diameter; and
an adjustable spring attached to said drum for applying a selected biasing force to said drum; and
a mechanical linkage for transmitting the force from said bias force generator to a lower region of said second vertical structure in opposition to the weight of said second vertical structure, said support member, and said object, the magnitude of said force being selected to counterbalance the weight of said second vertical structure, said support member, and said object, said mechanical linkage including a cable section adapted for spooling on said varying diameter surface of said drum.

4,943,021
GUITAR STAND
Timothy P. Clen, and Emmanuel C. Clen, both of 8431 Paso Iglesia, Spring Valley, Calif. 92077
Filed Aug. 7, 1989, Ser. No. 390,291
Int. Cl.[5] F16M *11/00*
U.S. Cl. 248—167 6 Claims

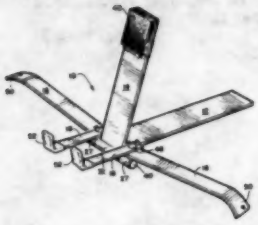
1. A collapsible portable guitar stand comprising:
an elongated backrest support leg having a top end and a bottom end;
an elongated rear support leg having a front end and a rear end;

a pair of elongated side support legs each having an outer end and an inner end;

hinge means for connecting the bottom end of said backrest support leg to the front end of said rear support leg comprising:

a top plate member having a first side, a pair of tubular leg portions are formed on said side and a cutout portion is formed between them;

a bottom plate member has a bottom end having a tubular



leg portion formed thereon that mates with said cutout portion; and

a pin is detachably received in the aligned tubular leg portions of said top plate member and said bottom plate member;

pivot means for securing the respective inner ends of said side support legs to said top plate member; and

support means for the bottom end of a guitar, said support means being pivotally connected to said top plate member.

4,943,022

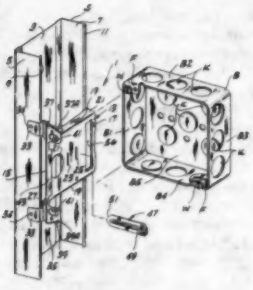
BRACKET FOR MOUNTING AN ELECTRICAL BOX ON A WALL STUD

Eric R. Rinderer, Highland, Ill., assignor to B-Line Systems, Inc., Highland, Ill.

Filed Apr. 12, 1989, Ser. No. 337,148

Int. Cl.[5] A47B 96/00

U.S. Cl. 248—205.1 **19 Claims**



1. A sheet metal bracket adapted for mounting an electrical box on a wall stud having a front face, a rear face and opposite sides, said bracket comprising

sheet metal support means having a front end, a rear end and a length not substantially less than the depth of the wall stud in front-to-rear direction,

sheet metal means adjacent the front end of said support means for attaching the bracket to the front face of the wall stud in a position in which said support means extends rearwardly across one side of the wall stud from a position generally adjacent the front face of the wall stud to a position generally adjacent the rear face of the wall stud, and sheet metal means integral with said support means for affixing an electrical box to said bracket in a position wherein one side of the box is engageable with said support means with the box extending in cantilever fashion laterally outwardly from said support means away from the wall stud.

4,943,023

DAM SUPPORT BRACKET FOR MASONRY CONSTRUCTION

Samuel R. Becker, 4336 Eastwood Dr., Sarasota, Fla. 34232

Filed Mar. 15, 1989, Ser. No. 323,954

Int. Cl.[5] E04G 17/00

U.S. Cl. 248—302 **6 Claims**

1. A bracket for temporarily securing a plate against a side of a concrete block of a wall, the concrete block having an inspection hole formed in its side exposing a cavity within the concrete block which is to be temporarily covered by the plate while concrete is poured into, and hardens within the cavity, the said bracket comprising:

a contoured length of rigid, slender, elongated material lying in a plane and formed into an inverted "L" configuration having negligible flexure and having an upright leg and a generally horizontal leg;

said upright leg structured to be inserted into the cavity adjacent the inspection hole;

said horizontal leg extending outwardly from said upright leg and the cavity between two stacked concrete walls and to be retained in this position by mortar between the concrete blocks;

said horizontal leg having a reverse bend at its distal end through about 180 degrees in the direction of said upright leg, presenting another leg generally parallel to said horizontal leg, to releasably receive and retain a rigid, slender bar in general horizontal orientation against the exposed surface of the plate in cooperation with another adjacent said bracket similarly positioned in another cavity;

said horizontal leg sized to allow a wedge to be releasably driven between the bar and the plate to secure the plate against the concrete block to cover the inspection hole while the concrete hardens within the cavity;

said horizontal leg being severed at a portion thereof which is adapted to extend from the concrete block after the concrete hardens.

4,943,024

PRINTED MATERIAL SUPPORT HOLDER

Stephen T. Meyer, Indianapolis, Ind., assignor to Deflecto Corporation, Indianapolis, Ind.

Filed Apr. 3, 1989, Ser. No. 332,538

Int. Cl.[5] A47F 5/00

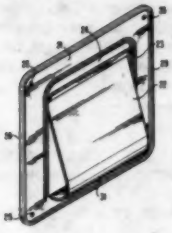
U.S. Cl. 248—316.7 **7 Claims**

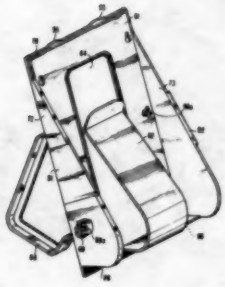
1. A holder for printed material and the like comprises:

a substantially flat support panel;

a curved clip having a lower edge which is integrally joined to said support panel and an upper edge, said clip being

curved outwardly and upwardly from said lower edge and extending back toward said support panel as it extends toward said upper edge; and





a pair of side panels which are disposed on opposite sides of said support panel and integrally joined therewith.

4,943,025

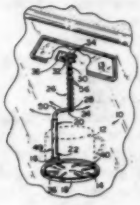
CUP HOLDER

Arnold D. Warner, 926 W. Main St., Ionia, Mich. 48846

Filed Jul. 6, 1988, Ser. No. 215,723

Int. Cl.[5] A47K *5/00*

U.S. Cl. 248—318 **10 Claims**



1. A cup and cup holder, said cup holder comprising:

a base removably supporting said cup;

a vertical column connected to an edge of said base and extending upwardly therefrom, said vertical column being received in a sleeve located at the edge of said base;

a cantilever arm extending outwardly from said vertical column at least to a point disposed approximately over the central portion of said base;

said vertical column being sufficiently tall and said cantilever arm extending outwardly from a point sufficiently high on said vertical column that said cantilever arm will not interfere with said cup seated on said base or with removal of said cup from said base;

a semi-flexible elongated strip connected to said cantilever arm at said point disposed approximately over the central portion of said base for suspending said cup holder, said semi-flexible strip extending upwardly from said cantilever arm to a hook attached thereto whereby said cup holder and cup seated on said cup holder base can be suspended from the vehicle mirror;

said elongated strip having first and second ends and includes a plurality of apertures disposed along a longitudinal axis of said strip, each of said apertures being adapted to snugly fit around a portion of said cantilever arm such that said flexible elongated strip can be adjustably connected to said cantilever arm by sliding at least one of said apertures over a portion of said cantilever arm;

said base including at least one slightly upraised peripheral lip for preventing said cup from sliding off said base, said lip being sufficiently low that it does not interfere with placement or intentional removal of said cup from said base, and such that intentional removal can be effected even with said cantilever arm extending outwardly to said point disposed approximately over said center of said base.

4,943,026

HANGER FOR SMALL PACKAGES

Gerhard Fildan, Leonberger Strasse 86, D-7259 Friolzheim, Fed. Rep. of Germany

Filed May 17, 1989, Ser. No. 353,317

Claims priority, application Fed. Rep. of Germany, May 20, 1988, 8806612

Int. Cl.[5] A47G *29/00*

U.S. Cl. 248—339 **1 Claim**

1. A holder for suspending a package comprising:

a hook;

a frame formed on a lower portion of said hook and having an upper frame member and a lower frame portion and a pair of side member connecting said upper frame member and said lower frame portion, said frame lying in a plane;

a locking finger extending downwardly from said upper frame portion and inclined downwardly and outwardly away from said plane of said frame at a front side of said frame in a rest position, said locking finger being formed with an inwardly and upwardly extending barb engageable in said package, said side members each being formed with a guide formation of triangular configuration defining a linear inlet ramp for guiding an edge of said package between said frame and said finger, an apex substantially at a level with said barb, and a linear guide surface extending from said apex toward said plane, said guide surfaces being parallel to said finger in said rest position thereof, said lower portion of said frame forming a security stirrup overlying a cover of said box and preventing unauthorized opening thereof as long as said box is retained in said hanger; and

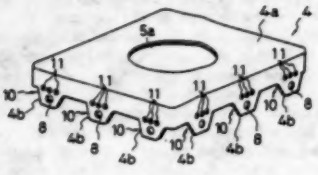
a double film hinge formed by two closely spaced horizontal film hinges between said upper frame member and said hook, said hook, said frame and said finger are all molded unitarily of a synthetic resin material.

4,943,027

MOUNTING ARRANGEMENT FOR A VEHICLE AIR BAG

Yoshikazu Nakayama, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Mar. 27, 1989, Ser. No. 328,838
Claims priority, application Japan, Mar. 29, 1988, 63-73269
Int. Cl.[5] F16M 13/00
U.S. Cl. 248—548 9 Claims



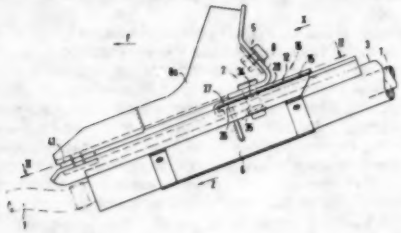
1. A mounting arrangement for a vehicle air bag comprising a mounting bracket affixed to a component of the vehicle, a base plate having a mounting portion on which an air bag and an inflator are mounted, and a plurality of fasteners connecting the base plate to the bracket, characterized in that there are plastically deformable structures associated with the fasteners and the base plate such that the mounting portion of the base plate is displaceable in a direction away from the mounting bracket in response to the forces imposed on the base plate at the end of development of the air bag.

4,943,028

STEERING COLUMN FASTENING ARRANGEMENT FOR MOTOR VEHICLES WITH A DEFORMATION ELEMENT

Martin Hoffmann, Vaihingen-Aurich; Helge Schittenhelm; Franz-Rudolf Wierschem, both of Weissach, and Horst Eichhorn, Tamm, all of Fed. Rep. of Germany, assignors to Porsche AG, Weissach, Fed. Rep. of Germany

Filed Jun. 20, 1988, Ser. No. 208,668
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720320
Int. Cl.[5] F16M 13/00
U.S. Cl. 248—548 18 Claims



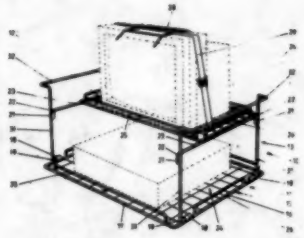
1. A steering column fastening arrangement for a motor vehicle with a deformation means between a steering bracket means retained on the body side and a protective tubular steering member, the deformation means including energy-absorbing plate means operatively connected with a bow-shaped bracket means of the tubular member, and plate means having deformation sections which are arranged corresponding to longitudinal slots of the bow-shaped bracket means, the energy-absorbing plate means frictionally clamped between a lower support element of the bow-shaped bracket means and upper guide elements arranged substantially parallel thereto, the upper guide elements being supported at the steering bracket means of the vehicle body and being provided with longitudinal slots which are arranged corresponding to the further longitudinal slots of the lower support element, displacement bolt means extending through the deformation sections and being guided in both the longitudinal slots, for providing a clamping force to clamp the energy absorbing plate between the lower support element and the upper guide elements, the upper guide and lower support elements extending substantially over the entire length of said deformation sections and said deformation sections being laterally delimited each by the longitudinal slots.

4,943,029

COMPUTER CARRY BASKET

Paul A. P. Szuster, 64 Clifton Street, Malvern, South Australia, Australia (5061)

Filed Jul. 26, 1989, Ser. No. 386,365
Int. Cl.[5] A47F 5/00
U.S. Cl. 248—917 4 Claims



1. A support frame for supporting a computer and its accessories, comprising

a base frame assembly and an upper frame assembly, each having two side rails and two end rails defining a respective peripheral frame,

retaining means on one said peripheral frame upstanding from the rails thereof sufficiently to retain a computer and on the other said frame, upstanding sufficiently to retain a computer accessory, against dislodgement when supported by the base or upper frame assembly.

two carry handle assemblies each comprising a pair of legs, a respective said carry handle bridging the legs, and extending outwardly away from the sides of the base and upper frame assemblies, each leg terminating in an inturned spigot, and

a respective vertical socket sleeve on each said leg between its ends, downwardly directed spigots on each of said side rails of the upper frame assembly which slidably engage within respective said vertical socket sleeves, two further socket sleeves on each said end rail of the base frame assembly which are horizontal, and inturned spigots on the lower ends of said carry handle legs engaging within respective said horizontal socket sleeves,

such that the handle assemblies retain the base and upper frame assemblies horizontal and in spaced relation to one another.

4,943,030

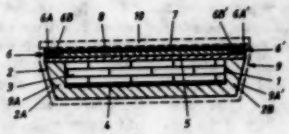
SKI

Josef Fischer, Ried im Innkreis, Austria, assignor to Fischer Gesellschaft m.b.H., Innkreis, Austria

Division of Ser. No. 923,417, Oct. 27, 1986, Pat. No. 4,781,395.
This application Sep. 8, 1988, Ser. No. 241,473
Claims priority, application Austria, Oct. 28, 1985, 3105/85
Int. Cl.[5] B28B 7/26
U.S. Cl. 249—121 3 Claims

1. A dish-shaped ski mould having side walls and a base wall,

the side walls having lower portions and upper portions, the lower portions being inclined outwardly from the base wall to the upper portions and the upper portions extending vertically



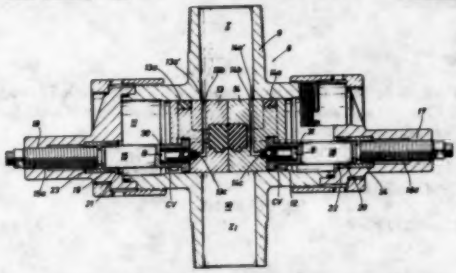
in parallel from the lower portions to a rim of the mould thereby providing a junction at the upper and lower portions forming a support for a prefabricated ski body component.

4,943,031

BLOWOUT PREVENTER

Denzal W. Van Winkle, Houston, Tex., assignor to Drexel Oilfield Services, Inc., Conroe, Tex.

Filed Aug. 17, 1989, Ser. No. 393,901
Int. Cl.[5] E21B 33/06
U.S. Cl. 251—1.3 5 Claims



1. Apparatus for use with a blowout preventer having a housing with a bore therethrough and longitudinally extending chambers which intersect the bore with rams reciprocable within the chambers between a first position for opening the bore and a second position for closing the bore to divide the bore into zones above and below the rams, said apparatus comprising:

a rod connected to each of the rams and extending longitudinally within each of the chambers and offset relative to the longitudinal axis of the chambers, the connection between said rod and its respective ram including means to accommodate a predetermined amount of free, relative longitudinal movement between said rod and the ram with which it is connected, said means to accommodate including a recess in the ram and an enlargement on the end of the rod for fitting within the recess, the width of said recess being greater than the width of said enlargement whereby said rod when moved longitudinally toward or away from the ram may move said predetermined free amount of longitudinal movement before moving the ram inwardly into the bore or before withdrawing the ram outwardly from the bore;

passage means in at least one ram, said passage means having a first passage end for communicating with the zone above the ram and a second passage end communicating with the chamber adjacent the end of said rod connected to the ram;

means for closing off communication from the zone below the ram to the zone above the ram, said means including valve means supported adjacent the end of said rod, said valve means including:

a longitudinally extending recess in the end of said rod;

a plunger telescopically received in said recess in the end of said rod that is connected with the ram;

spring means supporting said plunger for movement relative to said rod;

stop means to limit the movement of said plunger toward the ram;

closure means associated with the plunger for engaging and closing off said second passage end to prevent communication from the zone below the ram to the zone above the ram;

means to accommodate lateral movement of said valve means relative to said rod, said means to accommodate lateral movement including surface means on said plunger smaller in width than the recess in which said plunger is received to accommodate lateral movement of said plunger and closure means thereon relative to said rod; and

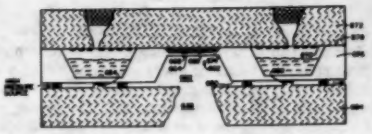
means for supporting the rods for reciprocation in their respective chambers between the first and second ram positions.

4,943,032

INTEGRATED, MICROMINIATURE ELECTRIC TO FLUIDIC VALVE AND PRESSURE/FLOW REGULATOR

Mark Zdeblick, Los Altos Hills, Calif., assignor to Stanford University, Stanford, Calif.

Division of Ser. No. 97,494, Sep. 16, 1987, Pat. No. 4,821,997, which is a continuation-in-part of Ser. No. 911,242, Sep. 24, 1986, Pat. No. 4,824,073. This application Sep. 19, 1988, Ser. No. 246,497
Int. Cl.[5] F16K 27/00
U.S. Cl. 251—11 4 Claims



4. An integrated pressure regulator comprising: first and second integrated valves comprising:

a first semiconductor wafer having first and second parallel and opposite surfaces and having a first trench formed in said first surface so as to leave a first flexible diaphragm between the bottom of said trench and said second surface of said wafer and having a second trench formed in said first surface so as to leave a second flexible diaphragm between the bottom of said second trench and said second surface of said wafer, and having third and fourth trenches formed in said first and second surfaces, respectively, so as to form a diaphragm, the bottom of said third trench being coated with a conductive film;

a second wafer bonded so as to seal said first and second trenches to form said first and second cavities;

first and second resistor patterns formed on said second wafer so as to be within said first and second cavities, respectively;

a conductive film formed on said second wafer aligned with said third trench so as to form a capacitor with the conductive film on the bottom of said third trench;

fluid sealed in said first and second cavities that, when heated by current flowing through said first and second resistor patterns, raises the vapor pressure in said first and second cavities so as to flex said first and second diaphragms;

a third water bonded to said semiconductor wafer and having first and second valve seats formed thereon adjacent to said first and second diaphragms, and having first and second input channels formed thereon and coupled, respectively, to said first and second valve seats thereby forming first and second fluid passageways from first and second input ports, and having an output channel formed

thereon so as to be coupled to both said first and second valve seats so as to form a fluid output passage for each of said first and second integrated valves.

4,943,033

FLOW CONTROL VALVE

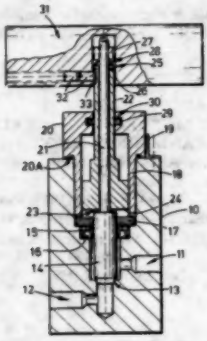
Andrew Clayson, Aberdeen, Scotland, assignor to Pacson Limited, Dundee, Scotland

Filed Sep. 18, 1989, Ser. No. 408,708

Claims priority, application United Kingdom, Sep. 20, 1988, 8822048

Int. Cl.[5] F16K *31/50, 1/48*

U.S. Cl. 251—88 **5 Claims**



1. A flow control valve comprising a central stem having a valve head at one end thereof and a plain end portion at the other end thereof, a retaining member engaging said plain end portion by means of an interference fit, and an operating sleeve on said stem for shifting the stem axially to close and open the valve by acting respectively on said valve head and on said retaining member.

4,943,034

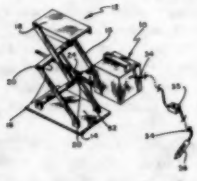
POWER JACK AND METHOD

Gerald E. Wagnon, Great Bend, Kans., assignor to Wagnon Power Jack, Inc., Great Bend, Kans.

Filed Apr. 24, 1987, Ser. No. 42,057

Int. Cl.[5] B66F *3/22*

U.S. Cl. 254—122 **4 Claims**



1. A jack and an adaptor in combination comprising a jack base; a pair of general parallel collapsible brackets pivotally secured to said jack base; support platform means secured pivotally to the pair of collapsible brackets; a pair of support-aligning bars connected to said pair of collapsible brackets with each support-alinging bar having a structure defining a threaded aperture a threadable jack shaft passing rotatably through the threaded aperture of each support-aligning bar such that when the threadable jack shaft rotates in a predetermined direction the two support-aligning bars are pulled towards each other causing the pair of collapsible brackets to become longer lengthwise and the support platform means to travel upwardly and such that further when the threadable jack shaft rotates in a direction opposite the predetermined direction the two support-aligning bars are pushed apart with respect to each other causing the pair of collapsible brackets to become shorter lengthwise and the support platform means to travel downwardly; an adaptor housing; a drive motor means disposed in said adaptor housing; a drive shaft means releasably engaged to said threadable jack shaft to rotate the same and coupled to said drive motor means; an engagement bracket means for engaging releasably the adaptor to one of the support-aligning bars of the jack and to prevent the adaptor from turning while the drive shaft is rotating the threadable jack shaft; and means for securing and biasing the engagement bracket means against the face of the adaptor housing; said engagement bracket means comprises a structure defining a bifurcated end having a pair of bracket arms where between the threadable jack shaft passes when the adaptor is engaged to one of the support-aligning bars; said structure of said engagement bracket means additionally defines a generally straight body portion and an upright back portion integrally bound normally to said straight body portion; and said upright back portion has a structure defining at least one aperture, and said means for securing and biasing passes through said aperture for biasingly securing the engagement bracket means to the face of the housing.

4,943,035

BARRICADE

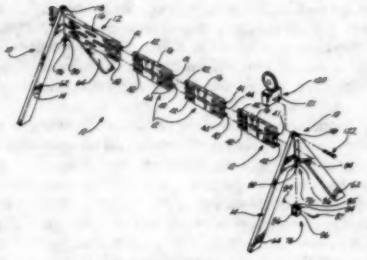
Kenneth L. Thomson, Huntington Beach, Calif.; Hank Fenton, Charlie Lake, and Norbert Tesch, Coquitlam, both of Canada, assignors to Amplas, Inc., Huntington Beach, Calif.

Filed Jan. 13, 1989, Ser. No. 297,101

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 8800324[U]

Int. Cl.[5] E04H *17/14*

U.S. Cl. 256—64 **9 Claims**



1. A barricade comprising:

(a) an elongated, hollow crossbar member comprising at least one elongated, inter-connecting hollow section inter-connectable with other such elongated hollow sections and formed from plastic by a molding process, each such section having first and second elongated sides, first and second edges connecting the sides, and a generally rectangular cross-section transverse to its length, one end of each such section having at least one male extension and its opposite end having at least one female receptacle for receiving and securing the male extension of a mating section, and at least one identation in the first elongated side formed during the molding process, wherein such an indentation extends to the second elongated side such that an interior surface of the indentation on the first elongated side is fused to an interior surface of the second elongated side; and

(b) a collapsible A-frame support for each end of the elongated, hollow crossbar member, each such collapsible

A-frame support comprising a pair of hollow legs, with each leg having a bottom end for contact with the ground surface and a top end which includes a tang and notch, with the tang and notch on one leg facing in one direction and the tang and notch on the other leg facing in the opposite direction, the legs being pivotally connected together below their top ends, so that when the legs are fully opened, their top ends are engaged with the tang of each such leg engaging the notch of the other leg, thereby locking the top ends of the legs together to thereby define an opening configured to receive one end of the elongated, hollow crossbar member.

4,943,036

METHOD AND APPARATUS FOR ISOTHERMAL HOLDING OF WIRE WHEN A WIRE IS HEAT-TREATED IN-LINE

Hiroki Sato, and Yoshiki Seto, both of Kanagawa, Japan, assignors to Neturen Company Limited, Tokyo, Japan

Filed Oct. 12, 1988, Ser. No. 262,733
Int. Cl.[5] C21D *9/64*
U.S. Cl. 266—104 **7 Claims**

1. Apparatus for maintaining wire travelling therethrough isothermal for a predetermined period of time, said apparatus comprising:

rapid heating means for rapidly heating wire isothermally to a predetermined temperature over the entire cross section thereof as the wire travels through the rapid heating means; and

temperature holding means disposed in-line with said rapid heating means and downstream thereof with respect to the direction of travel of the wire for maintaining the wire, after the wire is heated isothermally by said rapid heating means, at an isothermal holding temperature during the time the wire travels through the temperature holding means,

said temperature holding means comprising two operatively electrically connected electrodes spaced apart from one another a predetermined distance and disposed in the apparatus so as to contact the wire travelling through the temperature holding means and form a closed circuit therewith, and voltage generating means for maintaining the wire isothermal over the length of wire between said electrodes by applying a sufficient voltage to the wire in contact with said electrodes to generate Joule's heat in the wire corresponding to the amount of heat that would tend to dissipate from the wire under unforced cooling of the wire travelling over said predetermined distance in the temperature holding means.

4,943,037

SUSPENSION DEVICE WITH CAM SUPPORT MEMBER

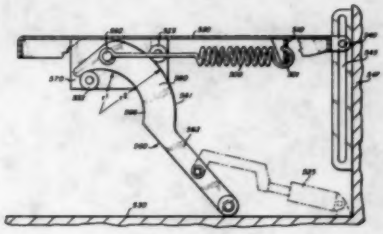
Cole T. Brodersen, Davenport, and Danny S. Foster, Bluegrass, both of Iowa, assignors to Sears Manufacturing Company, Davenport, Iowa

Continuation-in-part of Ser. No. 195,793, May 19, 1988, Pat. No. 4,856,763. This application Feb. 1, 1989, Ser. No. 305,464
Int. Cl.[5] A47C *7/14*; F16M *13/00*
U.S. Cl. 267—131 **11 Claims**

1. An angularly displaceable support arm for use in a suspension system that maintains two support surfaces in generally spaceable parallel relation, comprising:

a shaft with first and second ends;

a cam disposed at said first end, said cam having a larger arcuate can surface and a smaller arcuate cam surface, said cam surfaces defining a center point about which said cam pivots as the support arm is angularly displaced;



means disposed at said second end for permitting angular displacement of said support arm as the distance between the two support surfaces changes; and

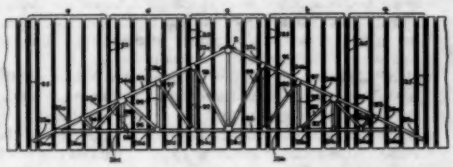
means for operatively connecting said support arm to the suspension system.

4,943,038

TRUSS ASSEMBLY APPARATUS

Charles W. Haraden, Fort Lauderdale, Fla., assignor to Alpine Engineered Products, Inc., Pompano Beach, Fla.

Filed Jul. 17, 1989, Ser. No. 380,588
Int. Cl.[5] B30B *3/02*
U.S. Cl. 269—37 **8 Claims**



1. A truss assembly table having a length and a width comprising:

a plurality of table sections in succession along the length of the table with openings between the sections extending across the width of the table, each of said table sections having a plurality of panels in succession lengthwise of the table separated by openings extending across the width of the table;

a plurality of lead screws extending across the width of the table along and below the openings between said panels;

manually-controlled power-operated means for individually rotating the lead screws;

a plurality of jig stop carriers threadedly coupled individually to said lead screws and movable along said openings between said panels across the width of the table in response to rotation of the corresponding lead screws;

a plurality of jig stops connected individually to said carriers and projecting above the top of the table above said openings between said panels;

and a plurality of power-operated lifts at said openings between said table sections, said lifts being movable upward to raise a completed truss above the top of the jig stops.

4,943,039

ADJUSTABLE CLAMP

Ronald E. Jackson, 216 W. Southport Rd., Indianapolis, Ind. 46217

Filed Mar. 13, 1989, Ser. No. 322,546
Int. Cl.[5] B25B 1/20
U.S. Cl. 269—45 **20 Claims**

1. A holding apparatus comprising:
a first and second clamp;
each clamp having a two arm handle each arm having a clamp end and an operator end;
coupling means for joining one of the two arm handles of the first clamp to a one of the two arm handles of the second clamp;
said coupling means including a U-shaped member comprising two leg portions separated by a bight portion;
said coupling means also including two connection means, one connection means connecting the one of the two arm handles of the first clamp to one of the legs of the two legged U-shaped member and another of the two connection means connecting the one of the two arm handles of the second clamp to the other of the two legs of the two legged U-shaped member;
wherein said connection means permit rotation of the clamps about a longitudinal axis of the legs of the U-shaped member as well as permitting rotation of the clamps along an axis at right angles to said longitudinal axis;
each of said connection means including two independently operable securing means for locking the rotation of one of the clamps with respect to the U-shaped member;
wherein one of the two securing means stops one of the clamps from rotating about the longitudinal axis of the leg of the U-shaped member without stopping rotation of the one clamp along the axis at right angles to said longitudinal axis; and;
wherein the other of the two securing means stops rotation of the one clamp at a right angle to said longitudinal axis without stopping rotation of the one clamp about the longitudinal axis of the leg of the U-shaped member.

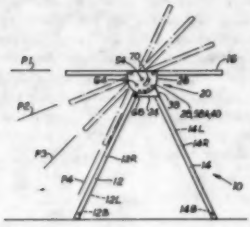
4,943,040

ADJUSTABLE WORK STAND

Clem B. Finstad, Red Wing, and Howard J. Fredrickson, Cannon Falls, both of Minn., assignors to Cannon Equipment Company, Cannon Falls, Minn.

Filed Jan. 26, 1989, Ser. No. 301,682
Int. Cl.[5] B25B 1/02
U.S. Cl. 269—69 **25 Claims**

1. A work stand comprising
(a) a fixed leg;
(b) a hinged leg;
(c) a leg bracket rigidly and non-movably affixed to the fixed leg and connected by a leg fulcrum to the hinged leg;
(d) a work table;
(e) a table bracket affixed to the table and hinged to a table fulcrum, said table fulcrum being fixed with respect to said leg bracket;



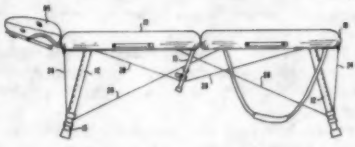
(f) a lock bolt engaging the hinged leg, the leg bracket and the table bracket, said lock bolt positionally fixing said table and said legs with respect to each other and in a rigid position of use.

4,943,041

LIGHT-WEIGHT FOLDING MASSAGE TABLE

Daniel C. Romein, 16 Dickinson Ave., Toms River, N.J. 08753

Filed Aug. 24, 1989, Ser. No. 398,221
Int. Cl.[5] A61G 13/00
U.S. Cl. 269—322 **3 Claims**



1. A light-weight folding massage table, comprising:
a pair of hingedly connected rectangular sections, having a padded upper surface and a peripheral underframe, said sections in an optionally opened position, with the sections being coplanar, or in a closed position, with the sections being parallel;
two pairs of telescoping legs rotatably connected to the side of the underframe near each end, which when the table is either in the closed position or in the flat opened position is coplanar to the undersurface of the table, and when the table is in the raised opened position extend angularly outward and downward from the underside of the table, providing substantial longitudinal stability;
a horizontal brace tube affixed to each leg of each leg pair;
two pair of leg brace cables overlappingly attached, in an X-configuration, from the lower end of one leg to the upper end of the other leg of the leg pair by an adjustment means, providing the leg pairs with a high degree of stability;
a pair of table locking bolts which pass through holes in the inner ends of the undersurface of both sections of the table, locking both sections together, when the table is in a fully open position and is held in place by a locking means;
a pair of bridge tubes rotatably connected to the locking bolts at the upper end and slit lengthwise at their lower end, which when the table is in the closed position or in the opened flat position is attached to the undersurface of the table and when the table is in the raised opened position extends angularly downward from the undersurface of the table, wedging the bridge tube against the frame;
a pair of bridge cables running longitudinally in a V-shaped manner along the inner edge of the underframe, connected

at each end to the upper leg joints and passing through the slit in the bridge tube, providing for compression of the table sections;

a bridge support cable is connected from the lower end of each bridge tube, and is secured at its center to the table end frame in an inverted V-shape;

a pair of end cables at each end of the table, attached to the horizontal leg brace by an adjustable means and detachably connected at the other end of the end cable to the end of the table providing longitudinal stability independent of the bridge cables;

two pairs of table-leg brace cables on each side of the table, each being attached at one end to the near end to the lower part of a leg, and attached at the other end to the near end of the opposite section, providing a tension on the end cable and longitudinally stabilizing the leg pairs;

a head rest detachably affixed to the outer end of one section;

a horizontal hand rest removably affixed to the head rest;

carrying handles affixed to one of the outer edges of each section;

a carrying strap is detachably affixed to the edge of the table.

4,943,042

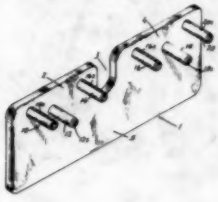
BAND SAW BLADE FIXTURE

Wayne Jung, 4005 Camrose Ave., New Berlin, Wis. 53151

Filed Oct. 30, 1989, Ser. No. 428,906

Int. Cl.[5] B25B *1/00*

U.S. Cl. 269—296 **4 Claims**



1. A flexible band saw blade fixture which comprises

a base member, said base member comprising a plate having an upper and lower portion, said lower portion adapted to be secured within a vise or other clamping device,

blade clamping means, said blade clamping means comprising a plurality of symmetrically located pins extending from one side of said base member upper portion, and

blade access means, said blade access means comprising a void in the base member upper portion situated at the center of said symmetrically located pins.

4,943,043

STACKER

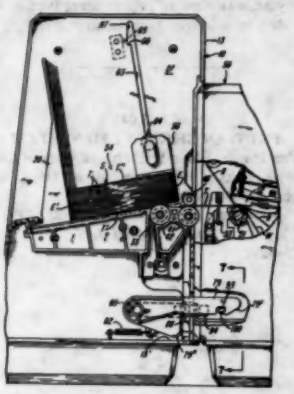
Orville C. Huggins, Dayton, and John D. Mistyurik, Tipp City, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 907,263, Sep. 15, 1986, abandoned. This application Jun. 12, 1989, Ser. No. 364,287

Int. Cl.[5] B65H *31/00*

U.S. Cl. 271—212 **12 Claims**

5. A stacker, comprising: a hopper adapted to receive a stack of tags, means for feeding tags into the bottom of the hopper, a weight for resting on the top of the stack, a guide for the weight, a switch at the top of the guide for disabling the feeding means, wherein the guide has means for allowing the



weight to be shifted and held at the top of the guide in cooperation with the switch to keep the feeding means disabled.

4,943,044

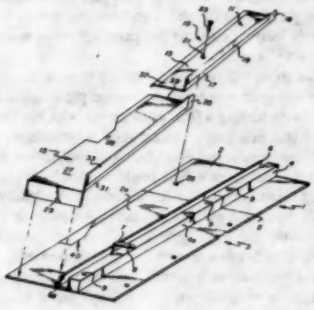
RAILS OF AN INSERTER MACHINE

Charles W. Roscart, R.D. 1, Box 168-C, Imperial, Pa. 15126

Filed Oct. 23, 1987, Ser. No. 111,665

Int. Cl.[5] B65H *9/04*

U.S. Cl. 271—248 **9 Claims**



1. In a machine designed to feed papers from a first station having a first gathering track to a second station having a second gathering track, said gathering tracks having a gap therebetween, an attachment device comprising:

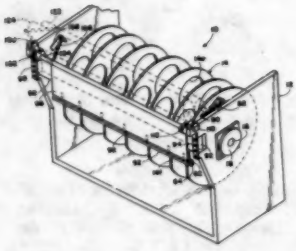
(a) an elongated body sized to overlie at least a portion of said first gathering track, at least a portion of said second gathering track and the entirety of said gap;

(b) first attachment means for attaching said attachment device in partial overlying relation to said first gathering track and second attachment means for attaching said attachment device in partial overlying relation to said second gathering track whereby papers being fed through said machine pass over said attachment device and are not caught in said gap; and

(c) said elongated body comprising first and second body members which are releasably coupled together, said second gathering track being downstream of said first gathering track in a direction of movement of papers thereover, said first and second body members having

overlapping structure with an upper portion of said overlapping structure being located on said first body member whereby smooth flow of papers thereover is substantially unimpeded by said overlapping structure.

4,943,045
PRINTER SHEET FEED SYSTEM
Arthur C. Van Horne; Eldon P. Hoffman, both of Lake Oswego, and Paul D. Bakke, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed Aug. 15, 1988, Ser. No. 232,419
Int. Cl.[5] B65H *3/00*
U.S. Cl. 271—277 **7 Claims**



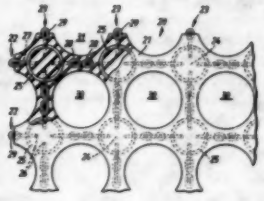
1. Apparatus for conveying a print medium sheet having a leading edge along a travel path through a printing zone where an image is printed on the sheet and having means for conveying the sheet leading edge to the printing zone, said apparatus being characterized by:

means for grasping the sheet leading edge after it travels to the printing zone comprising a base plate and an engaging plate, each having a face adjacent to which a sheet traveling to the printing zone travels, which faces face each other, said engaging plate being movable relative to said base plate between a first position in which the faces are spaced from each other for receiving the leading edge of the sheet, and a second position in which said faces are sufficiently close to grasp a sheet positioned therebetween, first biasing means for urging said engaging plate toward the second position, and an actuating plate positionable in a third position spaced from said engaging plate and a fourth position contacting said engaging plate, and second biasing means for urging said actuating plate toward the fourth position; and

means for transporting said grasping means away from the printing zone, and thereby transporting a grasped print medium sheet through the printing zone.

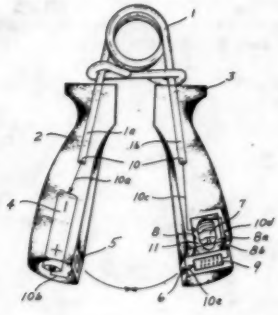
4,943,046
PLAYGROUND APPARATUS
Günter Beltzig, Hohenwart, Fed. Rep. of Germany, assignor to Sutcliffe Group Limited, England
Filed Feb. 22, 1989, Ser. No. 313,711
Claims priority, application United Kingdom, Mar. 1, 1988, 8804782; Feb. 13, 1989, 8903170
Int. Cl.[5] A63G *9/00*
U.S. Cl. 272—1 R **20 Claims**

1. Apparatus for use in a children's playground, the apparatus comprising a rigid ground-mountable frame and at least one chain having an end attached to the frame, wherein the at least one chain is a chain embedded in a resilient polymeric material and the disposition of the links of the chain is such as to permit



the chain and polymeric material structure to stretch resiliently under load.

4,943,047
HANDGRIP, WITH LIGHT AND TIMER
Edward E. Noble, P.O. Box 17238, Jacksonville, Fla. 32245-7238
Filed Feb. 26, 1986, Ser. No. 833,115
Int. Cl.[5] A63B *23/16, 21/00*
U.S. Cl. 272—68 **1 Claim**



1. A handgrip comprising,

a pair of elongated handles to be gripped by the hand, means mounting the handles together for movement of the handles toward and from each other in pivotal movement about a pivot axis that is disposed longitudinally beyond the handles whereby substantially the whole body of the handgrip is disposed longitudinally beyond the pivot axis,

the mounting means including spring means biasing the handles apart and yielding to enable the handles to be moved toward each other into interengagement, and the spring means being of great strength whereby the handles can be moved into such interengagement only by the full strength of the hand,

the handgrip including an electrical circuit which itself includes a battery, timer, light bulb, and contacts, and the contacts being exposed for non-yielding interengagmenet in response to the handles being moved into interengagement and effective when so interengaged for completing circuit and connecting the timer in circuit and thereby effecting operation of the timer, the electric circuit being normally open, and closed only when the handles are interengaged, the timer being inoperative when the circuit is open,

the light bulb being lighted when the circuit is completed, and positioned for eady observation by the user in the normal use of the handgrip,

the light bulb and timer being so relatively positioned that the light bulb when lighted illuminates the timer,

the light bulb and timer being mounted in the same handle, at the swinging end of the handle, the timer being beyond the light bulb in the direction toward the end of the handle, and

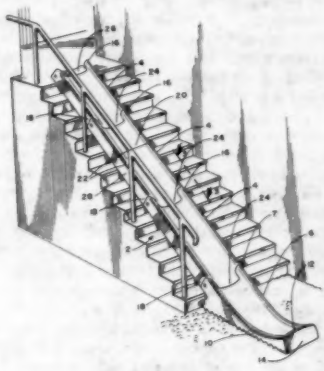
said handle having a front opening presenting the light bulb to the user in the normal holding of the handgrip, and an end opening effective for directing light rays longitudinally of the handle and onto the timer and illuminating the timer.

4,943,048

STAIRCASE AMUSEMENT SLIDE

Judith L. Hentges, 3347 E. Calhoun Pkwy., Minneapolis, Minn. 55408

Filed Jun. 26, 1989, Ser. No. 371,980
Int. Cl.[5] A63G *21/02*
U.S. Cl. 272—56.5 R **18 Claims**



1. A staircase slide for use on an incline of a set of stairs comprising:

at least one slideboard segment having a proximal and a distal terminus at either end along the length of the slideboard segment;

a terminal segment having a proximal and a distal terminus at either end along the length of the slide;

the proximal and distal termini of the slideboard segment and the proximal terminus of the terminal segment provided with separable connecting means for securely and releasably connecting a distal terminus of a slideboard segment to the proximal terminus of another slideboard segment, and separately and alternatively, releasably connecting a distal terminus of a slideboard segment to the proximal terminus of the terminal segment;

such that, when the terminal segment is positioned at a base of the set of stairs and the modularized connecting means are releasably connected, the length of the slide is supported along the incline of the set of stairs.

4,943,049

WIND-DRAG TYPE CLIMBER

Peter K. C. Lo, P.O. Box 13-124, Taipei, Taiwan

Filed Nov. 2, 1989, Ser. No. 430,784
Int. Cl.[5] A63B *23/04*
U.S. Cl. 272—70 **5 Claims**

1. A climber comprising:

a base frame;

a handlebar assembly fixed on said base frame so that a user can grip thereon;

two swing arms each mounted pivotally on said base frame at an end thereof;

two pedals respectively carried on the other ends of the swing arms;

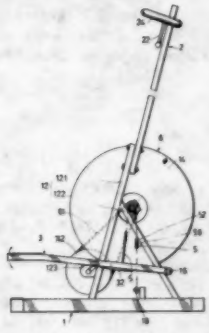
a wheel axle journalled on said base frame;

two first annular members sleeved rotatably on two end portions of said wheel axle;

two unidirectional bearings each interposed between said wheel axle and one of said first annular members so as to lock said first annular members on said wheel axle when said first annular members rotate in a predetermined direction;

two second annular members mounted rotatably on said base frame;

a drawing member extending around one of said first annular members, said second annular members and the other one of said first annular members;



two positioning devices each fastening an end of said drawing member to a selected one of several positions along length of one of said swing rods so that, when a user steps on and moves one of said pedals downward, the other of said pedals is moved upward, reciprocal movement of said drawing member alternately rotating said first annular members in clockwise and counterclockwise directions, thereby rotating said wheel axle in said predetermined direction;

a hub sleeved rotatably on said wheel axle;

a wheel body sleeved rigidly on said hub and having a plurality of generally radially extending wheel blades which create air impedance to rotation of said wheel body; and

a speed-increasing mechanism interconnecting said wheel axle and said hub so as to rotate said hub at a speed which is greater than that of said wheel axle.

4,943,050

ONE LEG EXERCISER

Robert S. Smith, 1263 Emory St., San Jose, Calif. 95126

Filed Apr. 13, 1989, Ser. No. 337,347
Int. Cl.[5] A63B *23/04*
U.S. Cl. 272—70 **12 Claims**

1. A device for exercising the muscles used in running which comprises:

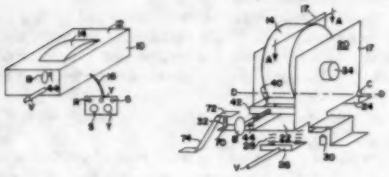
a wheel;

a housing having a platform and a base for supporting the user standing on one foot on said platform;

means for rotatably supporting said wheel;

means for connecting said base to said means for supporting said wheel in a location that permits said user to rotate said

wheel by strokes from the user's other foot applied to said wheel; and



means coupled to said wheel for generating a measurement corresponding to a rotational speed of said wheel and generating a signal responsive to said measurement.

4,943,051

HUMAN ENERGY TRANSMISSION DEVICE

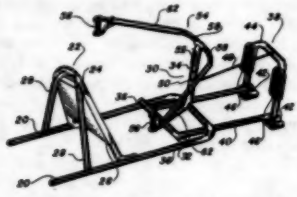
Don Haskins, 22622 Lake Side La., El Toro, Calif. 92630, and Lauren D. Haskins, Jr., 17565 Brightman Ave., Lake Elsinore, Calif. 92330

PCT No. PCT/US86/01119, § 371 Date Jun. 19, 1987, § 102(e) Date Jun. 19, 1987, PCT Pub. No. WO87/07167, PCT Pub. Date Dec. 3, 1987

PCT Filed May 27, 1986, Ser. No. 77,697

Int. Cl.[5] A63B *69/06*; B62M *29/00*; B63H *16/00*

U.S. Cl. 272—72 **14 Claims**



1. A human energy transmitting device comprising:

(a) a main frame having parallel sides and a structural backrest;

(b) a pivotal mast disposed between the parallel sides of said frame defining a compound lever freely rotatable thereupon for transmission of human power from combined body members;

(c) rotatable foot engaging means operatively connected to said frame in a planar relationship positioned in such a manner as to be contiguous with ones feet when in the sitting position between the parallel sides of the frame while recumbently reclining on the backrest;

(d) a thrust link freely reciprocable having one end pivotally mounted on the mast and the other end pivotally mounted on the foot engaging means for reciprocation of the mast when pressure is exerted upon the foot engaging means transmitting the force from ones feet when extendably pushing against the backrest to the mast; and,

(e) energy transmitting means having handles thereupon yieldingly connected to said mast, receiving combined linear force from both the foot engagement and the handles when gripped thereupon transmitting ones total energy from both the upper and lower parts of the human body onto a resistance medium.

4,943,052

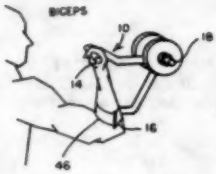
FREE-WEIGHT EXERCISING BARBELLS

Brice Powers, 2234 S. 15th Ave., Broadview, Ill. 60153

Filed Jan. 27, 1989, Ser. No. 302,819

Int. Cl.[5] A63B *13/00*

U.S. Cl. 272—123 **11 Claims**



1. An exercising barbell, comprising the combination of

a substantially rigid frame having spaced gripping, support and weight portions; elongated bars between the portions; and strap means near the support means and means to secure the strap means together in a looped fashion;

said gripping portion being suited to be gripped by an exerciser's hand, and the support portion being suited then to cooperate with and be secured by the looped strap means to a part of the exerciser's body spaced from the gripping hand, to form a two-point support of the barbell relative to the exerciser, to allow the exerciser to move the two-point support generally along a path within a vertically extended plane and shift the barbell between lower and upper positions in the course of an exercise, whereby the muscle(s) of the exerciser must be stressed; and

the three portions being oriented such that the center of gravity of the barbell is generally proximate the weight portion and is spaced from the gripping and support portions; and in the upper position, said weight portion being horizontally spaced from said path, to cause the barbell to continue to stress the same lifting muscle(s) of the exerciser.

4,943,053

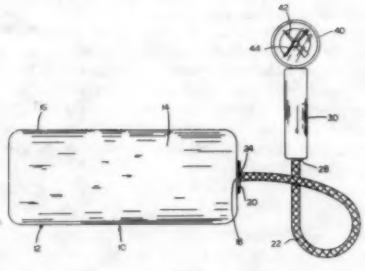
POST-OPERATIVE KNEE REHABILITATIVE DYNAMOMETER

Stephen H. Smith, R.D. 1, Box 150-B, Riegelsville, Pa. 18077

Filed Dec. 22, 1988, Ser. No. 289,587

Int. Cl.[5] A63B *21/02*

U.S. Cl. 272—135 **7 Claims**



1. A post-operative knee rehabilitative dynamometer comprising:

a. a cylindrically shaped open-cell body of light weight low density polyurethane foam body;

b. an airtight flexible skin having a thickness of about 10 to about 22 mils sealed about said foam body, said skin com-

prising at least one layer of vinyl material containing rubber based balloons as a thickening agent, at least one layer of vinyl based paint and a gloss coat layer, said skin having an opening to permit passage of air into and out of said foam body;

c. a hose sealed about said opening with a rubber grommet and extending into the center of said foam body remote from said opening, said hose channeling air passing in and out of said opening;

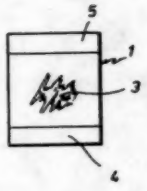
d. means connected to said hose for measuring the force of air passing through said hose upon application of knee force against said foam body, comprising a gauge having an active and passive marker connected to one end of a coupling member, said coupling member being surrounded by a flexible foam hand grip and connected to said hose on its other end.

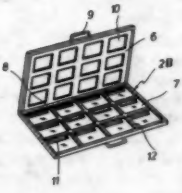
4,943,054

MENTAL GAME

Antonio S. Palou, Aribau 271, 08021, and Margarita V. Tarragona, Pedralbes 18, 08021, both of Barcelona, Spain

Filed Aug. 23, 1989, Ser. No. 399,065
Claims priority, application Spain, Jan. 4, 1989, 8900020
Int. Cl.[5] A63F 9/18
U.S. Cl. 273—1 R 6 Claims





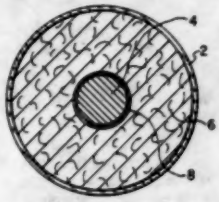
1. A mental game comprising: a plurality of cards having a front face and a back face, each of said cards having on at least the front face at least one first area containing an illustration and at least one caption and on at least the rear face a second area in which there is at least one second caption; a plurality of supports, each of which is formed by mutually superimposable first and second sheets, at least one of said sheets having means adapted to determine first and second set positions for at least one card, said first sheet being provided with at least one opening which, when the support contains at least one card, is adapted to be superimposed on one of the first areas of said card, while said second sheet is provided with at least one slot which, when the support contains at least one card, is adapted to be superimposed on one of the second areas of the same card.

4,943,055

WEIGHTED WARMUP BALL

Daryl Corley, 7108 Carolenna Ct., North Richland Hills, Tex. 76180

Filed Jul. 24, 1989, Ser. No. 384,328
Int. Cl.[5] A63B 69/40
U.S. Cl. 273—26 R 13 Claims



1. A ball comprising:

a metal center core;

an outer cover;

an intermediate material disposed between said metal center core and said outer core, said intermediate material consisting of packing or filler material; and

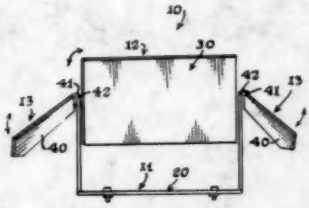
means for adhesively bonding said core to said packing or filling material for keeping said core in place within said packing or filling material.

4,943,056

PING PONG TABLE ACCESSORY APPARATUS

Kevin R. Bowers, 1476 Beverly Dr., Arcata, Calif. 95521

Filed Feb. 27, 1989, Ser. No. 315,641
Int. Cl.[5] A63B 69/00
U.S. Cl. 273—30 4 Claims



1. A ping pong table accessory apparatus for use with a ping pong table having a horizontal playing surface and net bisecting the horizontal playing surface wherein the apparatus comprises:

a support unit including a pair of upwardly projecting spaced apart support arms, each arm having a bracket element adjacent its upper end and recess in its upper end;

a ball rebound backboard unit comprising an elongated generally rectangular backboard member having horizontally spaced sides and front and rear surfaces, said backboard being operatively secured to a horizontally extending axle member said axle member having ends projecting beyond the sides of said backboard member; said ends of the axle member being received in a respective bracket element on said support arms for pivotally supporting said backboard between said support arms; and

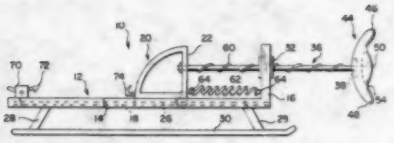
a pair of sideboard units, means engaging said recess for pivotally connecting each of said sideboards to the upper end of a said support arm for movement relative to said backboard.

4,943,057

TORSION-IMPARTING BLOCKING PRACTICE SLED

James G. Felder, 3577 Gaston Ave., Montgomery, Ala. 36105

Filed Aug. 10, 1989, Ser. No. 391,991
Int. Cl.[5] A63B 69/00
U.S. Cl. 273—55 R 13 Claims



1. A football blocking practice sled comprising, an elongated frame having forward and rearward ends, and a blocking pad for engagement by a practicing athlete, means mounting said blocking pad on said frame for rearward movement of said pad along said frame in response to a blocking force, means yieldably resisting said rearward movement and to move said pad in a forward direction upon removal of the blocking force, and, the improvement comprising,

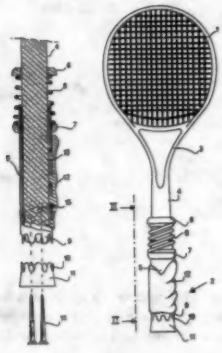
means for imparting a lateral twisting movement to said pad in response to a blocking force and rearward movement of said pad.

4,943,058

TENNIS RACKET WITH FIXED GRIP AND MOVABLE FRAME

Italo Carbonetti, 11 Via Prassitele, I 00125 Axa Acilia Sud RM, Italy

Filed Feb. 22, 1989, Ser. No. 313,525
Claims priority, application Italy, Sep. 21, 1988, 48367 A/88
Int. Cl.[5] A63B 49/08
U.S. Cl. 273—73 J 4 Claims



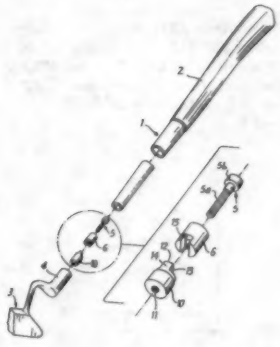
1. In a tennis racket having a frame part and a handle part formed by a hub solid with the frame part, a movable tubular sleeve rotationally and axially sliding on said hub, having an anatomic grip for the gripping of the hand of the tennis player in order to vary the angular attitude of the frame with respect to the grip, to cause the frame to assume a plurality of angular attitudes with respect to it and around its axis, said sleeve having an upper extremity proximal to the frame and a lower opposite extremity, the improvement comprising: said hub is of circular section and said movable sleeve is provided at its lower extremity with a toothed crown profile; a knob element integral with the free extremity of the hub has a toothed crown profile which can be meshed in an axial direction with said crown profile of the movable sleeve; an external periferal abutment is integral with said hub and disposed immediately below the connection of the hub with the frame; an external periferal abutment is integral with said sleeve and placed in proximity to the upper extremity of the same; and a compression coil screw abuts between said two periferal abutments externally to said hub and said sleeve, so that said sleeve can be rendered movable with respect to the hub by unmeshing said crown profiles and translating and turning the sleeve against the action of the spring, whereas the meshing of the crown profiles renders the sleeve and the hub integral with one another; and wherein the sleeve is provided with holes and the grip is anchored in said holes.

4,943,059

GOLF CLUB HAVING REMOVABLE HEAD

Joseph Morell, Annecy, France, assignor to Salomon, S.A., Annecy Cedex, France

Filed Jun. 3, 1988, Ser. No. 201,874
Claims priority, application France, Jun. 16, 1987, 87-08390
Int. Cl.[5] A63B 53/02
U.S. Cl. 273—80.1 20 Claims



20. A golf club comprising:

(a) a golf club head including a plug member containing a threaded axial bore;

(b) an elongated golf club shaft having a connector portion at one axial end and a gripper portion at the other axial end, said shaft containing an axially extending bore;

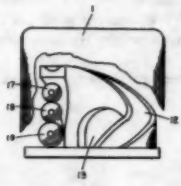
(c) a screw retained on the connector portion of said golf club shaft and threaded into said threaded axial bore of the plug member of said golf club head for operatively connecting said golf club shaft to said golf club head, wherein said screw is mounted on said golf club shaft for rotation about an axis of said bore of said golf club shaft, said screw having a threaded shank screwed into said axial bore of said golf club head, and having a screwhead for manually rotating said shank, said screwhead being accessible from said gripper portion of said shaft;

(d) a retention means for retaining said screw to said shaft wherein said retention means includes

(i) a plug carried by said shaft at its connector portion, said plug having an axial aperture for slidably receiving the shank of said screw when the head, thereof, is positioned in the bore of said shaft, whereby engagement of the screw head with the plug limits axial displacement of the screw in one direction; and

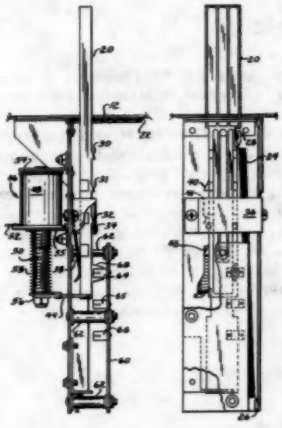
(ii) an elastic cap resiliently engaged with the bore of said shaft adjoining the plug of said retention means, said cap serving to limit axial displacement of said screw in a direction opposite to said one direction.

4,943,060
LITTLE MINI SNOWMAN GAME
Duane Peters, and Ty C. Peters, both of 2237 Terrace Dr., New Brighton, Minn. 55112
Filed Feb. 28, 1989, Ser. No. 316,777
Int. Cl.[5] A63B 63/00, 43/00
U.S. Cl. 273—109 12 Claims



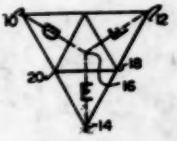
1. A miniature snowman game apparatus comprising a substantially flat base having spaced apart top and bottom surfaces and a plurality of apertures extending through said surfaces; at least one stake means attached to said base such that said stake extend above said top surface through said apertures in said base; said stake being equal to the number of apertures; a ramp means attached to said top surface having an upwardly curved body; a plurality of game pieces having holes therethrough; and a see through cover means attached to said base adapted to enclose said ramp, game pieces and stake means.

4,943,061
MULTI-POSITION DROP TARGET
Irwin J. Grabel, Elmwood Park, Ill., assignor to Williams Electronics Games, Inc., Chicago, Ill.
Filed Aug. 22, 1989, Ser. No. 396,998
Int. Cl.[5] A63B 71/00
U.S. Cl. 273—127 R 7 Claims



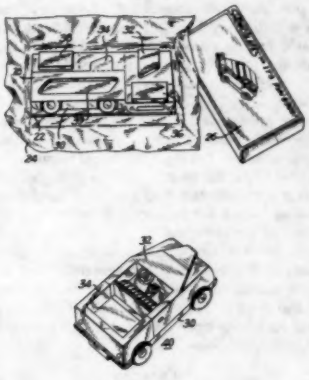
1. A multi-position drop target playfield feature for a rolling ball game comprising:
(a) a target member extending above the playfield movable between a plurality of discrete vertical positions, and having a plurality of reset projections (40–42) vertically disposed thereon, each reset projection corresponding to a different vertical position of said target member;
(b) means for lowering the target member one position each time it is struck by the rolling ball;
(c) means for raising the target member to reset it to its initial position, or to any intermediate position, said means for raising including:
(i) means for engaging said reset projections to raise the target member position;
(ii) means for reciprocally driving said engaging means; whereby each operation of said driving means causes said engaging means to raise the target member one position.

4,943,062
RANDOM INDICIA SELECTOR
Richard A. Gillette, 8567 Pomelo Tree La., Orlando, Fla. 32819
Filed Nov. 23, 1988, Ser. No. 275,437
Int. Cl.[5] A63F 9/04
U.S. Cl. 273—144 B 13 Claims



1. A random indicia selector comprising:
a housing containing a tumbling compartment;
a first plurality of identically sized, regular tetrahedron shaped dice bearing indicia on each face contained in said housing;
a second plurality of pyramidal shaped display cavities along one side of said tumbling compartment;
said housing sized so all of said first plurality of said dice may be tumbled about at least two axes in said tumbling compartment and a random second plurality of said dice may then be disposed in said display cavities.

4,943,063
CONVERTIBLE COMESTIBLE
Claude R. M. Moreau, 85-06 Sixtieth Ave., Elmhurst, N.Y. 11373
Filed Mar. 29, 1989, Ser. No. 330,055
Int. Cl.[5] A63F 9/10
U.S. Cl. 273—157 R 22 Claims



1. A convertible comestible comprising a processed foodstuff moldable into a three-dimensional geometric configuration as a food bar, said food bar being made of a plurality of distinctly different shaped and sized constituent portions being separable into a number of three-dimensionally complimenta-

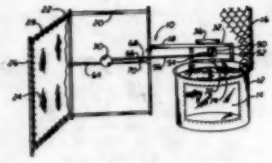
rily sculptured separate portions to interrelate with one another in a permutable three-dimensional configuration, said separate portions affording multi-level grouping in sequential arrangements with contiguous interfacing and occlusive interlocking to form a three-dimensional object in a given configuration.

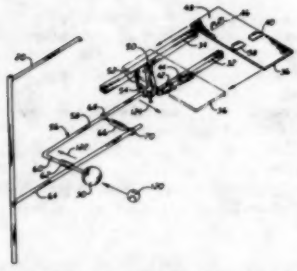
4,943,064

DUNK TANK SEAT RELEASE MECHANISM

Harry C. Smith, Jr., 520 Thompson Ave., Lehigh Acres, Fla. 33936

Filed Aug. 24, 1989, Ser. No. 398,764
Int. Cl.[5] A63B *63/00*; A63F *9/02*
U.S. Cl. 273—384 **10 Claims**





1. A dunk tank seat release mechanism comprising

support means disposable proximate the rear of a dunk tank

a seat hingably attached to said support means and being alternatable between generally horizontal and collapsed positions;

means, mounted to said support means, for releasably gripping said seat to hold said seat in a generally horizontal position, said means for gripping including a pair of opposing, pivotably interconnected, stationary and movable jaws, a stationary handle fixed to said stationary jaw, a movable handle pivotably attached to said movable jaw and means, for biasing said jaws closed when said movable handle is closed relative to said stationary handle to hold said seat;

an actuator member extending from between said stationary and movable handles generally laterally of the tank, said actuator member having a thickness between said handles such that a spacing of at least ¾" is provided between said actuator member and said movable handle, and further including means for mounting a target to face generally forward of the tank; and

means for pivotably mounting said actuator member to said support means; whereby engagement of said target with a predetermined force pivots said actuator member to engage and open said movable handle of said gripping means so that said jaws open and said seat is released.

4,943,065

BEAN BAG TOSS GAME TARGETS

David J. DeLapa, 501 Tammery Dr., Tallmadge, Ohio 44278

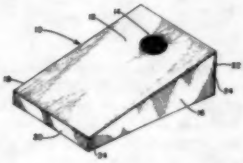
Filed May 25, 1989, Ser. No. 357,328
Int. Cl.[5] A63B *63/00*
U.S. Cl. 273—402 **19 Claims**

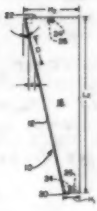
1. In a competitive game including at least one target and at least one bag filled with beans or other materials to be pitched at the target for scoring, a target structure which provides multiple possible scoring methods of the game comprising in combination:

a flexible target surface member having a smooth surface texture and a length L_1 and defined front and rear edges and a hole through it of sufficient size such that a bean bag will pass through it;

a front support member hingedly secured to the underside of said target surface member adjacent the front edge, said member having a height H_1 as measured from a ground plane; and

a rear support member hingedly secured to the underside of





the target surface member adjacent the rear edge, said member having a height H_2 as measured from the ground plane;

the ratio of the heights H_2/H_1 and said length L_1 being dimensioned so as to support said target surface member at an inclined angle "α" with respect to the ground plane such that said target surface member being comprised of a material which exhibits said smooth surface texture and flexibility when supported in said inclined position to enable a bag striking the target surface to either slide or bounce by spring action on the surface due to its slickness and flexibility depending upon the angle of incidence at which said bag strikes the surface.

4,943,066

BALL-LIKE ARTICLE

Delbert L. Lathim, Pasco, Wash.; Ting Liu, and Charles F. Foley, both of Charlotte, N.C., assignors to Research & Development of North Carolina, Charlotte, N.C.

Filed Feb. 2, 1989, Ser. No. 305,518
Int. Cl.[5] A63B *43/02*
U.S. Cl. 273—415 **23 Claims**

1. A ball-like article comprising a flexible permeable outer skin presenting a relatively soft and smooth peripheral surface which has a plush feel and defining a substantially enclosed

interior volume, said skin being of a size and shaped adapted to be readily grasped within the palm of one hand, a quantity of a granular material occupying only a portion of said interior volume with the remainder thereof occupied by air for generally fluidic movability within said interior volume in response to centrifugal, inertial, gravitational, manual and other externally imposed forces to enable said article to assume varied configurations, said article being characterized by a kneadable quality to be adapted for therapeutic manual manipulation, light manual tossing and catching, and other non-impactive recreational activities, and a tail portion attached to said outer skin for grasping and tossing said article.

4,943,067

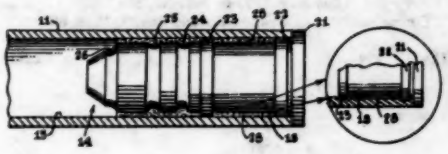
ARROW INSERT

Thomas A. Saunders, 1424 Vinton St., Omaha, Nebr. 68108

Continuation-in-part of Ser. No. 700,601, Feb. 11, 1985, abandoned. This application Oct. 16, 1985, Ser. No. 787,954

Int. Cl.[5] F42B 6/04

U.S. Cl. 273—416 **4 Claims**



1. The combination of: an insert; a threaded point for an arrow; and an arrow shaft having a cylindrically shaped wall of a predetermined inner and outer diameter disposed about a longitudinal axis on one end thereof, said insert comprising:

a cylindrical insert body of a first diameter adapted to be disposed in said one end of the arrow shaft;

an enlarged shoulder means disposed on said one end of said insert body extending from the inner to the outer diameter of said one end of said arrow shaft wall for preventing said insert body from sliding too far into said arrow shaft;

a first annular alignment ring means disposed on said one end of said insert body adjacent to said enlarged shoulder means, said first alignment ring means having an outer diameter of a size for causing a tight, closed slidable fit when said first alignment ring means is disposed in said one end of the arrow shaft;

a second annular alignment ring means disposed on the exterior of said insert body at a position spaced at a substantial distance from said first alignment ring means for causing the longitudinal axis of the insert body to be coincident and in alignment with the longitudinal axis of said arrow shaft, the outer diameter of said second alignment ring being larger than said first diameter of the insert body and larger than inner diameter of said arrow shaft and the outer diameter of said first alignment ring being larger than the outer diameter of said second alignment ring and larger than the arrow shaft to form a press fit with said arrow shaft; and

glue trap means for forming an enclosed space between said first and second alignment ring means, said insert body and the inner wall of the arrow shaft for sealingly holding an adhesive material provided for preventing the insert body from sliding out of said one end of the arrow shaft.

4,943,068

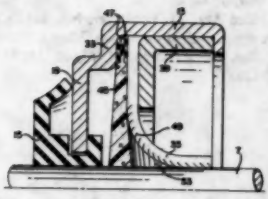
UNITIZED EXCLUSION SEAL

Frederick R. Hatch, Ann Arbor; William M. Riley, Milan, and Thomas M. Banks, Ypsilanti, all of Mich., assignors to Mather Seal Company, Milan, Mich.

Continuation of Ser. No. 75,170, Jul. 20, 1987, abandoned. This application Jul. 10, 1989, Ser. No. 378,442

Int. Cl.[5] F16J 15/32, 15/34, 15/44, 15/54

U.S. Cl. 277—23 **3 Claims**



1. A unitized seal for excluding debris from a portion of a rotating shaft, comprising:

an annular shaft-engaging member having an annular unitizing channel with a predetermined width formed therein, said channel bounded by radially outwardly extending annular projections having mutully confronting wall surfaces extending radially outwardly from said shaft-engaging member, said annular prejections having stiff axially extending sections to resist axial deflection and prevent disassembly of said unitized seal during installation of said unitized seal over said shaft;

a single lip element projecting radially outwardly from shaft-engaging member, said lip element formed with an annular tip portion having an axial section thinner than said axially-extending sections of said annular projections;

a metallic seal case member for efficiently conducting heat from said lip element to a seal housing, said seal case member comprising a radially inwardly projecting flange having a radial inner extremity formed with a width less than said predetermined width, said flange positioned within said channel with a clearance fit and having an exterior radially extending surface portion in contact with said lip element along a single contact band; and

a seal lip element mounted to said seal case member for sealing lubricant between said seal lip element of said case member and said rotating shaft and extending radially inwardly from said cast member for engagement with a portion of the shaft.

2. A unitized seal for excluding debris from a portion of a rotating shaft, comprising:

an annular shaft-engaging member having an annular unitizing channel with a predetermined width formed therein, said channel bounded by radially outwardly extending annular projections having mutually confronting wall surfaces extending radially outwardly from said shaft-engaging member, said annular projections having stiff axially extending sections to resist axial deflection and prevent disassembly of said unitized seal during installation of said unitized seal over said shaft;

a single lip element projecting radially ourwardly from said shaft-engaging member, said lip element formed with an annular tip portion having an axial section thinner than said axially-extending sections of said annular projections;

a metallic seal case member for efficiently conducting heat from said lip element to a seal housing, said seal case member comprising a radially inwardly projecting flange having a radial inner extremity formed with a width less than said predetermined width, said flange positioned within said channel with a clearance fit and having an exterior radially extending surface portion in contact with said lip element along a single contact band; and

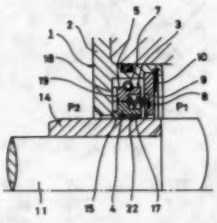
filter means disposed adjacent said shaft engaging member and within said case member for entrapping contaminants within said filter means and extending radially inwardly from said case member for engagement with a portion of the shaft.

4,943,069

SHAFT SEAL DISPOSED ABOUT A ROTATABLE SHAFT

Takeshi Jinnouchi, Sakado, Japan, assignor to Eagle Industry Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1989, Ser. No. 341,462
Claims priority, application Japan, May 10, 1988, 63-111623
Int. Cl.[5] F16J 15/16, 15/40, 15/34
U.S. Cl. 277—27 9 Claims



1. A shaft seal disposed about a rotating shaft means, comprising a non-rotating seal ring means disposed about said shaft means, resilient means disposed about said seal ring means and biasingly urging said seal ring means radially inwardly toward said shaft means, said seal ring means having a first inner cylindrical surface forming a sealing dam wear means and a second inner cylindrical surface forming a bearing pad means is attached, said seal ring means being biased by said resilient means into sliding contact with said shaft means, said bearing pad means having an initial inner diameter greater than the inner diameter of said sealing dam wear means so as to provide a clearance between said bearing pad means and said rotating shaft means, said sealing ring means having a third cylindrical surface from which said bearing pad means extends, said sealing dam wear means being constructed to rapidly wear upon sliding contact with said rotating shaft means during an initial run-in period such that after said initial run-in period, said bearing pad means comes into sliding contact with said rotating shaft means upon being urged radially inwardly by said biasing means such that both said sealing dam wear means and said bearing pad means are in sliding contact with said rotating shaft means which is the operating relationship between said seal ring means and said rotating shaft means over the life of the seal ring after said initial run-in period, said bearing pad means being constructed to last over the life of the seal ring when operating in said operational relationship.

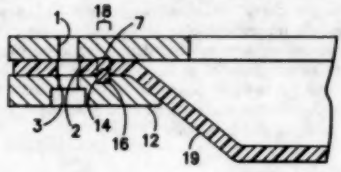
4,943,070

SEALING SYSTEM FOR DIAPHRAGM TYPE VULCANIZING PROCESS

Aage Lang, Kolind, Denmark, assignor to Milliken Denmark A/S, Morke, Denmark

Filed Oct. 13, 1988, Ser. No. 257,065
Claims priority, application Denmark, Jun. 30, 1988, 3639/88
Int. Cl.[5] F16J 15/12
U.S. Cl. 277—235 R 5 Claims

1. Sealing system for a vulcanizing press of the diaphragm type comprising: a diaphragm, a first flange member on one side of said diaphragm encompassing the perimeter thereof, a second flange member on the other side of said diaphragm encompassing the perimeter thereof and being operably associated with said first flange member, an indention in and around the interior side of one of said flange members facing said diaphragm member and means operably associated with said diaphragm member to force a portion of said diaphragm into said indentation when said flange members are pressed together to hold said diaphragm therebetween, said means including an endless groove in the inside of said flange member facing the flange member having said indentation therein and a strand of material of constant cross section in said groove having a height higher than the depth of said groove.

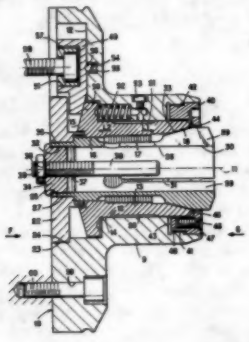


4,943,071

COLLET ADAPTABLE TO A MACHINE-TOOL FITTED WITH A CHUCK

Robert Srebot, Ris-Orangis, and Bernard Berthoud, Ponthierry, both of France, assignors to S.A. Srebort, Cedex, France

Filed Aug. 1, 1989, Ser. No. 388,330
Claims priority, application France, Aug. 3, 1988, 88 10517
Int. Cl.[5] B23B 31/10
U.S. Cl. 279—43 5 Claims



1. A chuck adapter for clasping a workpiece to be machined on a machine tool having a chuck which includes a front face, at least two clasping jaws movably affixed to jaw position adjustment means and a control device for the position adjustment means, comprising:

a frame having front and rear faces, said rear face having a plurality of radial grooves formed therein and further including means for attachment to the chuck front face, said frame having a central bore opening on said frame front face, said central bore having an axis of symmetry;

a main sliding element slidably carried within said central bore, having a frustoconical rear face disposed toward said frame rear face and a partially cylindrical, partially frustoconical bore opening toward said frame front face, said frustoconical bore portion lying at the extremity of said sliding element bore;

a collet having a rear portion fixed to said frame rear face, and a front portion projecting toward said frame front face, said collet front portion including a plurality of stems uniformly distributed around the circumference thereof, each said stem having an interior face for clasping the

workpiece and exterior frustoconical face, said exterior frustoconical face complementary to and bearing against said sliding element frusotoconical bore portion such that axial movement of said sliding element within said frame central bore results in radial movement of each said collet stem;

a plurality of slides, slidably carried in said frame rear face grooves, each said slide having a frustoconical face complementary to and bearing against said sliding element frustoconical rear face such that movement of said slides within said grooves results in axial movement of said sliding element within said frame central bore;

a plurality of adapting jaws, removably mounted on the chuck jaw position adjustment device and removably attached to said slides; and

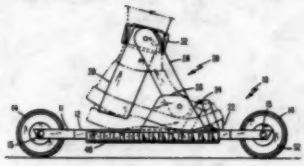
a resilient biasing member, located between said frame and said main sliding element, for urging said sliding element toward said frame rear face.

4,943,072

SIDE-ACTUATED BRAKING SYSTEM FOR PAIRED, WHEELED, FOOT VEHICLES

Sy Henig, 3926 Denfeld Ct., Kensington, Md. 20895-1539

Filed Aug. 24, 1989, Ser. No. 397,830
Int. Cl.[5] A63C *17/00*
U.S. Cl. 280—112 **14 Claims**



1. Side-actuated braking system for use in a pair of wheeled, foot vehicles, comprising, in each vehicle, a side-actuated braking means comprising

(a) a slidable plate provided at one edge with a row of teeth, said plate being attached to one of a pair of wheeled, foot vehicles so that the row of teeth extends outwardly and opposingly from a side of the one foot vehicle to face and adapted for engagement with a similar row of teeth outwardly extending from the opposing side of the other of the pair of wheeled, foot vehicles, whereby movement of either foot vehicle relative to the other causes sliding movement of the slidable plate when the rows of teeth are engaged;

(b) wheel rotation retardation means actuable between a non-braking position and a braking position; and

(c) interconnection means connecting the slidable plate with the wheel rotation retardation means in a manner such that sliding movement of the plate in either direction from a first non-braking position to a second braking position actuates the wheel retardation means from a non-braking position to a braking position.

4,943,073

HAND TRUCK FOR TRANSPORTING HEAVY FLAT ARTICLES

Robert G. Wander, 3444 Dove Hollow Ct., Palm Harbor, Fla. 34683-2211

Filed May 12, 1989, Ser. No. 351,148
Int. Cl.[5] B62B *3/02*
U.S. Cl. 280—47.27 **10 Claims**

1. A two-wheeled hand truck, comprising:

an axle member having first and second opposite ends;

first and second laterally spaced wheel members rotatably mounted to said first and second ends of said axle member, respectively, for transporting the hand truck relative to a support surface;

a non-rotatable mounting means fixedly secured to said first end of said axle member, laterally outward of said first wheel member;

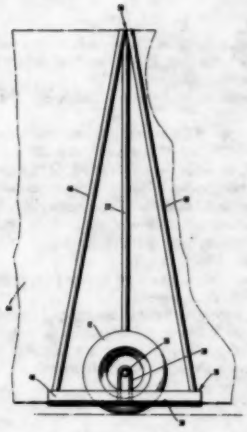
said mounting means being inclined laterally inwardly at a first predetermined angle;

an elongate "L"-shaped angle iron member, having a substantially vertical wall and a substantially horizontal wall, being secured, substantially mid-length thereof, to said mounting means in substantially orthogonal relation to an axle of rotation of said axle member with said vertical wall of said angle iron member extending at said first predetermined angle;

said angle iron member having longitudinally spaced apart forward and rearward opposite ends;

a first, linear in configuration, elongate frame member having a lower end fixedly secured to said forward end of said angle iron member, on a laterally inward side thereof;

said first frame member being inclined laterally inwardly at said first predetermined angle and rearwardly at a second predetermined angle;



a second, linear in configuration, elongate frame member having a lower end fixedly secured to said rearward end of said angle iron member, on a laterally inward side thereof;

said second frame member being inclined laterally inwardly at said first predetermined angle and forwardly at said second predetermined angle;

a third, linear in configuration, elongate frame member having a lower end non-rotatably mounted to said second end of said axle member, laterally inwardly of said second wheel member;

said third frame member being inclined laterally inwardly only at said second predetermined angle;

said first, second and third frame members having upper ends disposed in abutting relation to one another in vertically spaced relation to a point about one-third of a distance from said first wheel member to said second wheel member;

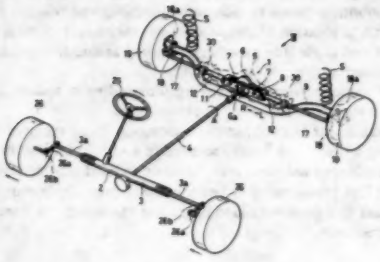
whereby a flat board having a lower edge supported by the horizontal wall of said angle iron member is tilted laterally inwardly by said first predetermined angle and is supported by said first and second frame members along diagonal lines.

4,943,074

STEERING MECHANISM FOR VEHICLE REAR WHEELS

Tomoyuki Kido, Osaka, Japan, assignor to Daihatsu Motor Co., Ltd., Osaka, Japan

Filed Dec. 21, 1988, Ser. No. 287,289
Claims priority, application Japan, Dec. 28, 1987, 62-335827
Int. Cl.[5] B62D 7/00
U.S. Cl. 280—91 **14 Claims**



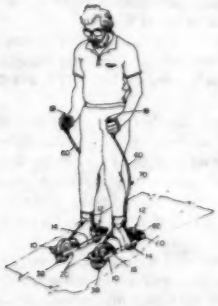
1. A steering mechanism for vehicle rear wheels comprising:
an input shaft rotated in response to rotation of a vehicle steering wheel,
a cam member connected to said input shaft for rotation therewith,
a follower support for holding a pair of cam follower rollers spaced widthwise of the vehicle with said cam member interposed therebetween, said support being rectilinearly movable widthwise of the vehicle when said input shaft is rotated, each of said cam follower rollers being rotatably supported on said follower support by means of a roller shaft extending perpendicularly to the widthwise direction of the vehicle, and
a tie member connecting said follower support to a knuckle arm of each rear wheel,
wherein an eccentric bush is interposed between at least one of said cam follower rollers and a corresponding shaft so that said one follower roller is adjustable in position relative to said corresponding roller shaft by rotation of said bush.

4,943,075

PAIR OF WHEELED SKATE-SKIS WITH BRAKES USABLE ON MOST TERRAINS

Patrick G. Gates, 9716 122nd St. East, Puyallup, Wash. 98373

Filed Aug. 18, 1989, Ser. No. 395,881
Int. Cl.[5] A63C 17/14
U.S. Cl. 280—842 **5 Claims**



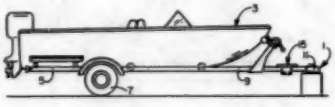
1. A pair of wheeled skate-skis with hand operated brakes for use on most terrains, each of the wheeled skate-skis, comprising:
(a) a channel frame having a web and depending platform to receive a sportspersons foot already fitted into a selected sport shoe, and the outside surfaces of the depending flanges equipped with an adhered strip of one component of a "Velcro" or "Dual Lock" or like fastener, and having wheel receiving cutouts both fore and aft in the web to receive fore and aft wheels, and having transverse holes in the depending flanges by the cutouts to receive fore and aft transverse wheel axles, and having at one end of the web a vertical hole to receive a fastener used in mounting to the channel frame, a bicycle type spring return pivotal calipered braking unit;
(b) fore and aft wheels mounted on the fore and aft transverse wheel axles; and
(c) said bicycle type spring return pivotal calipered braking unit mounted at the end of the web, having a fastener extending through said verticle hole in the channel frame for and operating handle thereof, extendable from the braking unit up to the waist height locales of sportspersons, who will be using this pair of wheeled skate-skis having hand operated brakes.

4,943,076

SAFETY TRAILER STEP

Randall K. Tripke, Rte. 1, Box 62, Malone, Wis. 53049

Filed Sep. 14, 1988, Ser. No. 244,015
Int. Cl.[5] B60R 3/00
U.S. Cl. 280—166 **6 Claims**



1. Safety apparatus for providing footing on a selected member comprising:
a. a platform having upper and lower surfaces;
b. a pair of side plates connected to and depending from the platform lower surface and generally perpendicular thereto, the side plates being spaced a predetermined distance apart to snugly fit over the selected member, the side plates having respective free ends that define at least one set of aligned holes therethrough;
c. bolt means for passing through the aligned holes in the side plates and adjacent the selected member to rigidly mount the safely apparatus to the selected member; and
d. at least one generally U-shaped spacer adapted to nest between the side plates and platform, the spacer having side legs that define holes that are aligned with the holes in the side plates when the spacer is nested between the side plates and the platform,
so that the safety apparatus can be rigidly mounted to selected members having a variety of widths.

4,943,077

ENCLOSED SINGLE-AXLE DRIVING MECHANISM FOR BICYCLES

Chuan-Sheng Lin, and Wei Lil, both of Taichung, Taiwan, assignors to Yu-Fu Traffic Supplier Ltd., Co., Taichung, Taiwan

Filed Nov. 18, 1988, Ser. No. 273,041
Int. Cl.[5] B62M 1/06
U.S. Cl. 280—260 **9 Claims**

1. An enclosed single axle driving mechanism for a bicycle having rotary pedal cranks rotatably attached to a frame comprising:
(a) a driving spindle;
(b) driving means connecting the pedal cranks to the driving

spindle such that rotation of the pedal cranks causes rotation of the driving spindle;

(c) a wheel hub;

(d) driven means connecting the driving spindle to the wheel hub such that rotation of the driving spindle causes rotation of the wheel hub, the driven means comprising:

(i) a gear case;

(ii) a first driven gear;

(iii) means connecting the first driven gear to the driving spindle such that the position of the first driven gear may be axially adjustable with respect to the driving spindle;

(iv) an auxiliary driven gear rotatably mounted in the gear case so as to engage the first driven gear;

(v) mounting means rotatably mounting the first driven gear to the gear case such that the first driven gear is axially adjustable to enable the engagement between the first and auxiliary driven gears to be adjusted; and,

(vi) means connecting the auxiliary driven gear to the wheel hub; and,

(e) attaching means to removably attach the gear case to the frame such that the gear case, and the first and auxiliary driven gears may be attached and removed as a unit.

4,943,078

HEAVY DUTY TRANSPORT VEHICLE

James R. McGhie, 2970 S. Lexington, St. Paul, Minn. 55121, and Robert D. Dieleman, 6109 S. Industrial Rd., Las Vegas, Nev. 89118

Filed Apr. 28, 1988, Ser. No. 187,557

Int. Cl.[5] B62D *53/08*

U.S. Cl. 280—408 **13 Claims**

1. A load hauler for travelling on conventional road ways to move, for example heavy construction equipment such as cranes or the like from one work site to another, said hauler comprising:

(A) a front carriage comprising a rigid frame supported upon a multiplicity of hydraulically suspended, independent wheel and axle units, said wheel and axle units being spaced apart from one another longitudinally along and laterally across said frame; a first fifth wheel coupling at the leading end of such front carriage for connecting to the fifth wheel coupling of a tow vehicle, and a second fifth wheel coupling on said frame at a position spaced rearwardly from said first fifth wheel coupling;

(B) a rear carriage comprising a rigid frame supported upon a multiplicity of hydraulically suspended, independent wheel and axle units spaced apart from one another longitudinally along and laterally across said frame, said rear carriage having a third fifth wheel type or similar coupling thereon intermediate the leading and trailing end thereof;

(C) a load unit having detachably connected thereto a forwardly projecting and a rearwardly projecting pair of goosenecks, each of said goosenecks having a fifth wheel coupling with the one on the forwardly projecting gooseneck connected to the said second fifth wheel coupling on the front carriage and the other to said third fifth wheel type coupling on said rear carriage;

(D) valved hydraulic circuit means interconnecting the hydraulic suspensions of said wheel and axle units selectively to distribute the load equally amongst all of the wheel units and control stiffness of roll of the load about on axis lengthwise of the hauler;

(E) gas charged accumulator means associated with the hydraulic suspensions providing a spring suspension system; and

wherein at least some of the independent wheel and axle units are steerably mounted on the carriage associated therewith.

4,943,079

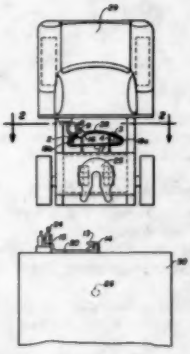
TEMPORARY TRAILER BRAKE RELEASE SYSTEM

Jay R. Harbold, York Springs, Pa., assignor to Harbold's Auto & Truck Inc., Camp Hill, Pa.

Filed Jul. 14, 1989, Ser. No. 379,875

Int. Cl.[5] B60D *1/62*; B62D *53/08*

U.S. Cl. 280—420 **9 Claims**



1. A system for temporarily releasing a spring actuated emergency brakes which are controlled by an air system on a semi-trailer without the operator leaving a cab of a tractor for towing a semi trailer so that it can be moved about in a freight marshalling yard, comprising an air injector probe means on the tractor for supplying air to the semi-trailer emergency air system; a valve means on the semi trailer for receiving the injected air supply coupled with an "or" valve to close a glad hand when air is injected; location means on the semi trailer for establishing an exact spatial relationship between said valve and a semi trailer king pin; an arcuate track means for positioning the injector probe means at an exact distance from a center of a tractor fifth wheel, said distance being the same as that between the semi trailer king pin and the air receiving valve means on the semi trailer; a trolley means for carrying the injector probe along the arcuate track means to achieve correct alignment between the injector probe means and the trailer air receiving valve means a drive means for providing trolley means movement along the track means; sensing means for sensing trolley travel limits and alignment between the air injector probe means and the air receiving valve means switch-

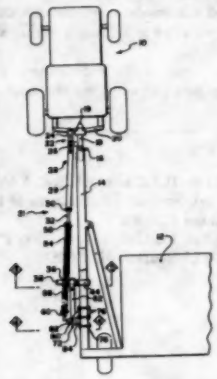
ing means for controlling electrical and pneumatic circuits of the system; and air injector probe means extension and retraction means for establishing connection between the air injector probe means and the air receiving valve means.

4,943,080

SWATHER HITCH DEVICE FOR PULL-TYPE IMPLEMENTS

Alden L. F. Reimer, Box 58, Neville, Saskatchewan, Canada S0N 1T0

Filed Aug. 18, 1989, Ser. No. 395,460
Claims priority, application Canada, Aug. 24, 1988, 575598
Int. Cl.[5] B60D *1/34*
U.S. Cl. 280—455.1 **13 Claims**



1. A towed implement control device for an implement with an implement tongue at one side thereof, the tongue having a hitch for connection to the draw bar of a towing vehicle, said control device comprising:

a strut pivotally mounted on the implement tongue and projecting laterally from the tongue to a side thereof opposite the implement;

a control tongue extending along the side of the implement tongue opposite the implement and slideably connected to the strut;

control hitch means pivotally connecting the control tongue to the towing vehicle at a position adjacent the draw bar hitch;

spring means acting between the control tongue and the strut to resist relative sliding movement of the control tongue and the strut; and

a beam pivotally connected to the strut and pivotally connected to the implement tongue, at a position further from the hitch than the strut.

4,943,081

VEHICLE SUSPENSION ASSEMBLY

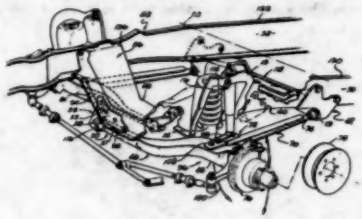
William Golpe, San Bernardino, Calif., assignor to Rancho Industries, Inc., Long Beach, Calif.

Filed Feb. 10, 1989, Ser. No. 309,460
Int. Cl.[5] B60G *3/00*
U.S. Cl. 280—666 **9 Claims**

1. A suspension assembly for supporting a wheel of a motor vehicle having a chassis comprising a first longitudinal chassis member, a second longitudinal chassis member, each chassis member having a lower center portion, a raised end portion and a bend transition portion between the lower center portion and raised end portion, and a suspension cross member coupled between the raised end portions of the first and second longitudinal chassis members, the first longitudinal chassis member being nearest the wheel and having a suspension attachment site located along the lower center portion of the first longitudinal chassis member, the suspension assembly comprising:

a suspension bracket mounted to the suspension cross member at a location remote from the first longitudinal chassis member;

an axle beam having an outboard end and an inboard end, the inboard end movably mounted to the suspension bracket;



a chassis bracket attached to the first longitudinal chassis member at the suspension attachment site; and

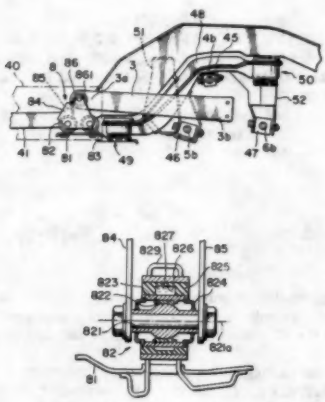
an elongated radius arm having a rear end and a forward end, the forward end of the radius arm coupled to the axle beam at a location adjacent to the outboard end of the axle beam and the rear end of the radius arm movably mounted to the chassis bracket.

4,943,082

VEHICLE SUSPENSION MECHANISM

Takao Kijima; Takeshi Edahiro; Toshihide Koyama, and Haruyuki Taniguchi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 15, 1988, Ser. No. 244,848
Claims priority, application Japan, Sep. 19, 1987, 62-235778; Apr. 28, 1988, 63-105934
Int. Cl.[5] B60G *7/00*
U.S. Cl. 280—673 **7 Claims**



1. In a vehicle suspension mechanism including

swing arm means extending in a longitudinal direction of a vehicle and swingably connected with a vehicle body,

means for connecting a plurality of lateral link means to extend in a transverse direction of the vehicle, and

supporting structure means for supporting a front end portion of the swing arm means,

the improvement comprising:

a pair of bracket members connected with said supporting structure means in a spaced relationship with each other in a transverse direction of the vehicle,

first supporting means provided in said supporting structure means and carried by said bracket members for vertically swingably mounting said swing arm means,

second supporting means provided in said supporting structure means for swingably carrying said bracket members about a longitudinal axis of the vehicle,

said second supporting means having a pair of bushing structures spaced from each other in the longitudinal direction of the vehicle,

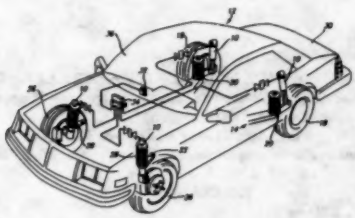
each of said bushing structures being provided with a pillow-ball member having a spherical portion at a middle portion, said bushing structures extending in the transverse direction of the vehicle and joined with the bracket members at opposite ends, an inner tubular member arranged around the pillow-ball member for rotatably carrying the pillow-ball member, an outer tubular member provided around the inner tubular member through a rubber member, and a joint bracket member for connecting the outer tubular member with the vehicle body.

4,943,083

SIGNAL CONDITIONING CIRCUIT ASSEMBLY

Gary W. Groves, Monroe, Mich., and David L. Perry, Sylvania, Ohio, assignors to Monroe Auto Equipment Company, Monroe, Mich.

Filed Mar. 13, 1989, Ser. No. 322,543
Int. Cl.[5] B60G 17/08
U.S. Cl. 280—707 **28 Claims**



1. A shock absorber for damping the movement of the body of an automotive vehicle, said shock absorber comprising:

a pressure cylinder;

a piston disposed within said pressure cylinder operable to divide said pressure cylinder into first and second portions;

a piston rod operable to support said piston in said pressure cylinder, said piston rod having first and second portions;

a signal conditioning circuit assembly disposed within said first portion of said piston rod, said signal conditioning circuit assembly comprising:

(a) a first sensor means for generating a first output in response to the difference in pressure between the damping fluid in said first and second portions of said pressure cylinder, said first sensor means being disposed in a first portion of said piston rod;

(b) a header disposed within said first portion of said piston rod and being operable to support said first sensor means;

(c) a first signal conditioning circuit electrically communicating with said first sensor means, said first signal conditioning circuit operable to generate a second output in response to the first output of said first sensor means;

(d) a circuit mounting platform operable to support said first signal conditioning circuit, said header being operable to positionally secure said circuit mounting platform within said first portion of said piston rod;

means for generating an electrical control signal in response to said second output of said first signal conditioning circuit; and

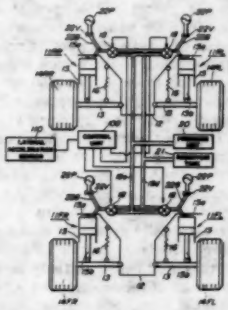
electrical controllable flow means for regulating the flow of damping fluid between said first and second portions of said pressure cylinder, said electrical controllable flow means being disposed adjacent to at least part of second portion of said piston rod.

4,943,084

ACTIVELY CONTROLLED SUSPENSION SYSTEM FOR SUPPRESSING ATTITUDE CHANGE OF VEHICULAR BODY

Yukio Fukunaga; Naoto Fukushima; Yohsuke Akatsu; Sunao Hano, and Masaharu Satoh, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 11, 1988, Ser. No. 255,560
Claims priority, application Japan, Oct. 9, 1987, 62-255744
Int. Cl.[5] B60G 11/26
U.S. Cl. 280—707 **11 Claims**



1. A control system for an automotive suspension system for controlling vehicular attitude comprising:

a suspension system disposed between a vehicle body and a suspension member which rotatably supports a vehicular wheel, said suspension system having a variable pressure chamber filled with a working fluid of controlled pressure

a pressure adjusting means, associated with said variable pressure chamber, for adjusting the pressure of said working fluid in said pressure chamber

a sensor means monitoring acceleration causing vehicular attitude chamber to produce a first sensor signal indicative of said measured acceleration

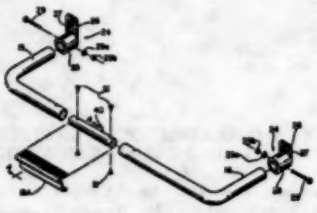
a control unit receiving said first sensor signal, deriving suspension control signal value on the basis of said first sensor signal for suppressing attitude change, said control unit outputting a control signal to control said pressure adjusting means for adjusting suspension characteristics to suppress vehicular attitude change, said control unit being responsive to said first sensor signal representative of an acceleration greater than a predetermined value for deriving said suspension control signal to allow a given magnitude of attitude change wherein said control unit increases the magnitude of attitude change according to increasing of the accelerator when said acceleration is greater than said predetermined value.

4,943,085

SIDE BAR ASSEMBLY FOR VEHICLES SUCH AS PICK-UP TRUCKS, OFF-ROAD VEHICLES AND THE LIKE

Michael J. Straka, Newburgh, N.Y., assignor to Sparkomatic Corporation, Milford, Pa.

Filed Apr. 27, 1989, Ser. No. 344,125
The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.
Int. Cl.[5] B60R 3/00
U.S. Cl. 280—770 10 Claims



1. A side-bar assembly for attachment to a chassis of a pick-up truck, off-road vehicle or the like capable of being mounted on such vehicles of a plurality of different sizes and configurations, the side bar assembly comprising a pair of substantially L-shaped tubular members forming half-bar tube sections to collectively form a generally U-shaped side bar to extend laterally from a side of the vehicle wherein the U-shaped side bar includes a pair of transverse parallel side-legs to project substantially perpendicular to the vehicle longitudinal axis and a connecting cross-leg to extend parallel to said axis, the L-shaped tubular members being of predetermined outer radius and each having a first straight tube leg to form one of the side-legs of the U-shaped side bar and having a second straight tube leg connected to the first tube leg by a curved substantially 90° bend to form the cross-leg of the side bar, a substantially semi-cylindrical connector sleeve defining a concave tube-gripping recess having a radius over a portion thereof corresponding substantially to said outer radius of said second tube legs to receive the latter therein in alignment with each other with the connector sleeve partially encircling and gripping adjacent portions of the second tube legs over more than half a circumferential extent of each, and mounting means for bolt securement to the vehicle chassis to receive and support end portions of the side-legs therein, said connector sleeve being an axially elongated cylindrically curved body having a partially encircling inwardly concave abutment surface to engage and conform to confronting exterior surfaces in the tube legs along the axial length of the sleeve for at least about a quarter of the circumference of the tube legs and having an uppermost part thereof shaped to define a step-on tread-forming portion to abut the tube legs along a longitudinal line at a tube leg location diametrically opposite portions of the tube leg engaged by part of said concave abutment surface.

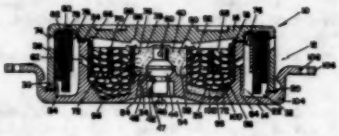
4,943,086

GAS BAG INFLATOR WITH A TWO WELDED JOINT HOUSING

Donald J. Cunningham, North Ogden, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Jun. 30, 1989, Ser. No. 374,426
Int. Cl.[5] B60R 21/26
U.S. Cl. 280—741 40 Claims

1. A vehicle inflatable crash protection bag inflator comprising first and second structural components, one of said first and second structural components including a first cylinder which is welded to a mating surface on the other of said structural components to define a first chamber, one of said first and second structural components including a second cylinder which is welded to a mating surface on the other of said structural components and which is concentric with and outwardly of said first cylinder to define a second chamber between said first and second cylinders, a solid gas generant composition disposed in said first chamber and operable upon ignition to produce gas, means including a perforated tubular member within said first chamber and igniter material within said tubular member for igniting said solid gas generant composition



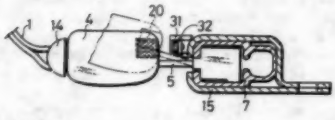
which igniting means is free of attachment to one of said structural components, said first and second structural components connected by only two welded joints, aperture means in said first cylinder for directing gas produced in said first chamber into said second chamber, means in said second chamber for filtering the gas, and outlet port means in said second cylinder for flow of the gas out of the inflator.

4,943,087

WARNING DEVICE FOR PASSIVE SEAT BELT SYSTEM

Takanobu Sasaki, Yokohama, Japan, assignor to Nippon Seiko Kobushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1989, Ser. No. 341,691
Claims priority, application Japan, Apr. 25, 1988, 63-55768[U]; Mar. 15, 1989, 1-29517[U]
Int. Cl.[5] B60R 22/00
U.S. Cl. 280—804 9 Claims



1. A warning device for a passive seat belt system, comprising:

an emergency release buckle connected to a slider which moves along a slide rail arranged in a room of a vehicle;

a tongue carrying an occupant-restraining webbing fastened thereto;

a magnet displaceable between a first position and a second position, said magnet assuming the first position while the tongue and emergency release buckle are latched but a second position while the tongue and emergency release buckle are unlatched;

an anchor base member maintained in engagement with the slider while the slider is at an occupant-restraining position, whereby a tension applied to the webbing may be transmitted to a body of the vehicle; and

a magnetic flux sensor for detecting a magnetic flux from the magnet, said magnetic flux sensor being arranged between the anchor base member and the emergency release buckle.

4,943,088

PICTURE BOOK WITH A PEN CONTAINING WATER-SOLUBLE INK

Yoshiomi Wada, 3-53-10, Higashi Oizumi-machi, Nerima-ku, Tokyo, Japan

Filed Sep. 6, 1988, Ser. No. 240,917
Claims priority, application Japan, Sep. 10, 1987, 62-137455
Int. Cl.[5] B42D *1/00, 1/06, 15/00;* B42F *3/00*
U.S. Cl. 281—39 6 Claims

1. A picture book, having front and back covers and intermediate leaves for use with a water-soluble ink pen comprising:

a base material on which images of pictures, words, numerals, figures or patterns or combinations thereof can be printed; and

a transparent and liquid-impermeable plastic coating attached to at least one side of the base material, whereby any images printed on the base material are visible through the transparent and liquid-impermeable plastic coating and from which the water-soluble ink, when applied via the removably attached pen to the transparent and liquid-impermeable plastic coating, is easily removed.

4,943,089

FINGERPRINT SENSITIVE PAD

David C. Reardon, 50 Nottingham, Springfield, Ill. 62704

Filed May 17, 1989, Ser. No. 352,888
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—81 5 Claims

1. A fingerprint sensitive pad for imprinting and storing a fingerprint image on a document, comprising:

a substrate sheet having a reflective surface and an opposing surface;

a layer of inkless imprinting material applied to said reflective surface of the substrate sheet to receive an imprint of a finger;

a flexible protective cover hingedly mounted along an edge of said substrate sheet to protect a latent fingerprint image from degradation and adulteration during storage; and

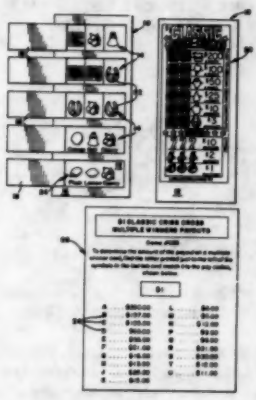
a layer of adhesive backing on said opposing surface of the substrate sheet to secure the fingerprint sensitive pad to a document, wherein the document in association with said fingerprint sensitive pad provides an identification records system for positively identifying a person involved in a transaction.

4,943,090

LOTTERY-TYPE GAMING APPARATUS

Debra Flenberg, Chicago, Ill., assignor to Douglas Press, Inc., Bellwood, Ill.

Filed Apr. 10, 1989, Ser. No. 335,564
Int. Cl.[5] B42D *15/00;* A63B *71/00*
U.S. Cl. 273—139 6 Claims



1. A lottery-type gaming apparatus, comprising:

a plurality of playing cards, each of which can be purchased by game players for a predetermined price for each of said playing cards,

each of said playing cards having plurality of groups of game symbols displayed thereon, with each of said playing cards including selectively removable means for initially concealing the groups of game symbols displayed thereon prior to purchase of a playing card by a player, said means for concealing said game symbols being removed by the player after purchase,

at least some of said playing cards being in the form of winning playing cards by having at least one of said groups of gaming symbols displayed thereon corresponding to at least one of a plurality of predetermined winning groups of said game symbols, each of said predetermined winning groups corresponding to a predetermined award value awarded to the player,

each of said playing cards having displayed thereon a listing of the various ones of the plurality of predetermined winning groups of said game symbols so that a player can determine the award value of any predetermined winning group of said game symbols displayed on the player's card,

at least some of said winning playing cards being in the form of multiple winner playing cards by having displayed thereon multiple ones of said predetermined winning groups of said game symbols, said multiple winning playing cards each further including, in addition to said multiple predetermined winning groups, one of a plurality of different multiple winner code designations displayed thereon and concealed by said means for concealing prior to purchase but visible upon removal of said concealing means, each said multiple winner code designation corresponding to a predetermined total of the plural award values of the multiple winner playing card on which the code designation is displayed; and

a multiple winner code key separate from each of said playing cards and having displayed thereon all of the plurality of different multiple winner code designations and all of the predetermined total of plural award values to which the code designations correspond, to thereby facilitate

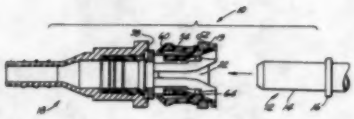
convenient determination of the total award values of one of said multiple winner playing cards.

4,943,091

QUICK CONNECTOR

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Filed Apr. 7, 1988, Ser. No. 178,550
Int. Cl.[5] F16L 25/00
U.S. Cl. 285—12 8 Claims



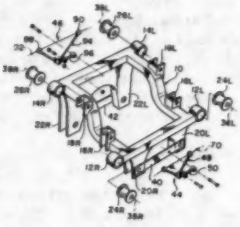
1. A connector assembly, comprising,
a tubular male member,
a tubular female member having an end portion configured to mate with said male member when inserted therewithin, and
a retainer member having a body preassembleable with either of said male and female members and including first means for preselectively resisting assembly of said male member into said female member when said retainer member is preassembled into said female member and second means for preselectively resisting assembly of said male member into said female member when said retainer member is preassembled onto said male member.

4,943,092

STRUCTURE FOR MOUNTING SUSPENSION MEMBER BY LONGITUDINALLY ARRANGED ELASTIC BUSHES

Tetsunori Haraguchi, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 17, 1989, Ser. No. 339,253
Claims priority, application Japan, Apr. 21, 1988, 63-98524
Int. Cl.[5] B62D 21/11
U.S. Cl. 280—660 4 Claims



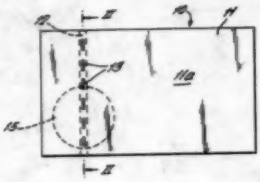
1. A structure for mounting a suspension member to a body of a vehicle, said suspension member supporting control arms at opposite sides of the vehicle, comprising: four substantially cylindrical elastic bushes disposed at four points of said suspension member spaced in the longitudinal and lateral directions of the vehicle, said bushes each being interposed between said suspension member and the vehicle body to extend in the longitudinal direction of the vehicle, and two assist links disposed at two points spaced in the longitudinal direction of the vehicle, said assist links each being engaged between said suspension member and the vehicle body to restrict lateral shiftings of said suspension member relative to said body.

4,943,093

SECURITY PAPER FOR BANK NOTES AND THE LIKE

Raymond J. Melling, Overton, and Malcolm R. M. Knight, Basingstoke, both of United Kingdom, assignors to Portals Limited, Basingstoke, United Kingdom

Filed Nov. 14, 1988, Ser. No. 270,066
Claims priority, application United Kingdom, Dec. 4, 1987, 8728390; Aug. 31, 1988, 8820535
Int. Cl.[5] B42D 15/00; G09F 19/00, 19/12, 19/14
U.S. Cl. 283—83 28 Claims



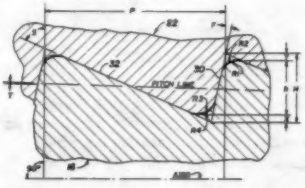
1. Security paper comprising opposed surfaces for the provision of printing to identify a document formed from the security paper, a security device positioned between the two surfaces of the security paper as a public security feature such that at least a portion of the said security device is totally imbedded within the security paper, said security device being of not more than 5 mm width, and comprising a flexible, water-impermeable substrate with a layer of metal on at least one side of the substrate, there being present on one side of the device a continuous metal path along its length, wherein said device has metal-free portions which transmit light of between 10% and 50% of the area of the device, said metal-free portions along the length of the device providing a repeating means of identification with at least some of the metal-free portions across the transverse direction of the device being wholly surrounded by metal.

4,943,094

THREADED PIN AND BOX CONSTRUCTION FOR COMPOSITE TUBULARS

Pat Simmons, Mineral Wells, Tex., assignor to Centron Corporation, Mineral Wells, Tex.

Filed Sep. 30, 1988, Ser. No. 251,679
Int. Cl.[5] F16L 25/00
U.S. Cl. 285—333 1 Claim



1. An improved connector for nonmetallic resinous tubulars, fittings or the like comprising:
a pin and box construction for threaded engagement with both the pin end and box end having a thread tapered in the range of 1 to 1½ degrees, a frusto conical shaped tapered guide surface positioned on the pin end adjacent the terminal end of said thread which cooperates with the box construction to align the threads of the pin end and box end in order to minimize the possibility of cross-threading, said thread having a pitch of 0.250 inch, a stab flank angle

in the range of 66 degrees to 67 degrees, a pressure angle in the range of 7.5 degrees to 20 degrees and a thread height of 0.075 inch.

4,943,095

STEPPED THREAD AND CUTOFF THREAD JOINT EXHIBITING EXCELLENT FATIGUE RESISTANCE

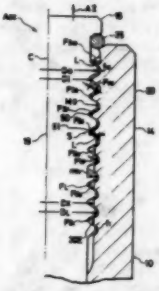
Nobuyuki Sugimura, 308, Mahase, Shimizu-shi, Shizuoka-ken, Japan

Continuation of Ser. No. 276,623, Nov. 28, 1988, abandoned. This application Nov. 2, 1989, Ser. No. 431,675

Claims priority, application Japan, Mar. 4, 1988, 63-51316; Mar. 4, 1988, 63-51317

Int. Cl.[5] F16L *25/00*

U.S. Cl. 285—334 10 Claims



5. A stepped thread joint between a vessel main body and a vessel closure plate, said main body being subjected to varying internal pressures and therefore subjecting said joint to fluctuating loads, said joint comprising:

a first thread on said main body and a second thread on said closure plate, said first and second threads each having corresponding crests and roots, said crests of said first thread having surfaces for matably contacting corresponding crests of said second thread to join said main body and said closure plate,

wherein said first thread has a stabbed thread portion, an intermediate thread portion and a standard thread portion in succession along said first thread,

said first thread having its crest contact surfaces reduced such that a line connecting ends of each crest of said first thread is in stair-stepped form;

the diameter of each root of said first thread being equal;

such that the maximum bending moment per unit area generated at each root of said first thread is substantially uniform when said first thread is subjected to said fluctuating load.

4,943,096

WINDOW LOCK APPARATUS

William C. Looper, 935 Highland Mist La., Charlotte, N.C. 28215

Filed Sep. 19, 1989, Ser. No. 409,911

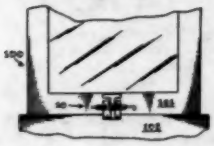
Int. Cl.[5] P05C *3/04*

U.S. Cl. 292—213 3 Claims

1. A window lock apparatus for locking a lower window sash relative to a window sill wherein the apparatus comprises:

a pivoted bracket member having a base portion that is operatively engaged with one of said window sill and window sash; wherein, said base portion is pivotally attached to a pivoted bracket element provided with a latch element; wherein the pivoted bracket element has a generally T-shaped configuration including a relatively elongated stem and a cross-arm and a single latch element is formed on the stem of the pivoted bracket element;

a stationary a bracket member operatively engaged with the other of said window sash and window sill; wherein the stationary bracket member is provided with at least one latch element; and, wherein the latch elements on said pivoted and said stationary bracket members are adapted to be brought into alignment with one another; wherein the stationary bracket member comprises a rigid bracket element having a pair of spaced and aligned latch elements and a generally U-shaped face panel forming arms wherein each one of the pair of aligned latch elements are disposed on each one of the arms of the bracket element respectively; and, wherein said rigid bracket element is further provided with: a horizontal plate attached on one end to the bottom of the face panel; and, a vertical mounting flange attached to the other end of said horizontal plate; and,



an elongated bolt member dimensioned to be received in said latch elements in said stationary and pivoted bracket members to prevent relative movement between the window sill and the lower window saah; and, whereby the removal of said elongated bolt member from said latch elements allows the window sash to be raised relative to said window sill until such time that the cross arms on the T-shaped pivoted bracket element come into contact with the stationary bracket member such that the window sash may be raised in a releasable yet captive disposition relative to said window sill.

4,943,097

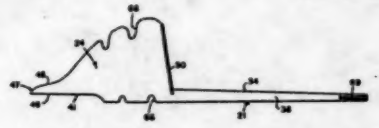
MANUALLY OPERABLE PERSONAL CONVENIENCE IMPLEMENT

Sampson D. Sanger, Liberty, N.Y., assignor to Yehuda Naim, Floral Park, N.Y.

Filed Jan. 17, 1989, Ser. No. 297,926

Int. Cl.[5] A47G *25/90*

U.S. Cl. 294—19.1 1 Claim



1. A manually operable, multi-functional personal convenience implement comprising a device having an elongated arm having a first end and a second end with a portion of a conical wedge section having two converging edges at said first end;

said wedge having concavities on the converging edges of said wedge with said concavities separated a spaced distance from one another, the spaced distance being greater than width of the concavity;

said wedge also having concavities on rear of said wedge, with said concavities separated a spaced distance from one another, the spaced distance being greater than the width of the concavity; and

a hook means on the second end of said elongated arm for grasping an article.

4,943,098

PARTS SUPPLYING APPARATUS

Yoshitaka Aoyama, 20-11, Makitsukadai 2-chome, Sakai-shi, Osaka 590-01, Japan

Filed Jun. 23, 1988, Ser. No. 210,490

Claims priority, application Japan, Jun. 26, 1987, 62-160477; Sep. 5, 1987, 62-222839; Oct. 9, 1987, 62-255567; Oct. 16, 1987, 62-262488

Int. Cl.[5] H02N *15/00*

U.S. Cl. 294—65.5 **3 Claims**

1. A parts supplying apparatus, comprising a single hollow outer cylindrical shaft; and an inner cylindrical shaft substantially inserted into said hollow outer shaft for slidably forming a supply rod; a magnet disposed at an end of at least one of said inner and outer shafts for attracting and holding a part; a first projection formed at said end of said at least one of said shafts for supporting said part; and a second single projection coupled to and perpendicularly extending from said shaft having said magnet disposed thereto, wherein said second projection and said shaft having said second projection, when descending, are stopped by a stopper member disposed outside of said inner and outer shafts to thereby permit said part to be forcibly pushed out by said end of said shaft having said first projection so as to overcome a retaining force of said magnet by relative displacement of said shafts near a place where said part is destined to be supplied.

4,943,099

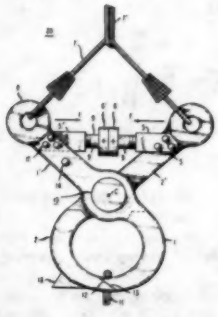
TONGS-LIKE CARGO HOOK DEVICE WITH AUTOMATIC LOADING AND UNLOADING CAPABILITY

Edwin Z. Gabriel, 91 Mt. Tabor Way, Ocean Grove, N.J. 07756

Filed Oct. 24, 1988, Ser. No. 261,940

Int. Cl.[5] B66C *1/38*

U.S. Cl. 294—82.32 **11 Claims**



1. A cargo hook device for quickly scooping up and releasing suspended cargo remotely and automatically, comprising a tongs-like part A, having two elongated members, pivoted near their mid-section by a central pivot pin, and having hammerheads with exterior faces, for use with a load cable and hoist cables, each cable being adapted for attachment to said part A, said members having upper and lower portions, each said upper portions having a weight for automatically separating said portions upon touchdown of said cargo, said lower portions having complementary-shaped, sharp-edged beveled jaw ends having upper and lower surfaces, which close against each other end-to-end to form a smooth continuous contour between said engaging ends when supporting said load cable, because of the tension on said hoist cable; said upper portions having inside surfaces with a primary rod fastened horizontally to each of said inside surfaces, with said device in an upright position, and each rod having said hammerhead at one end and each said hammerhead extending inward and containing a permanent magnet, said magnet's exterior having the same polarity as the polarity of the magnet contained in the opposing hammerhead, so that the two magnets when coming together tend to repel with a force of sufficient intensity to assist in said ends separating from each other the moment said hoist cables slacken upon touchdown of said cargo; said magnets enabling said ends to disengage automatically with less magnitude of said weight, thereby reducing said device's weight; siad magnets also preventing said exterior faces when abutting from sticking together and hindering the separation of said jaw ends due to high compressive forces; said beveled ends, one beveled at its lower and the other at its upper surface, shaped so as to automatically scoop up a load cable lying between said ends, when said device is lifted.

4,943,100

DRAIN SUITED FOR INSTALLATION IN WOODEN FLOORS

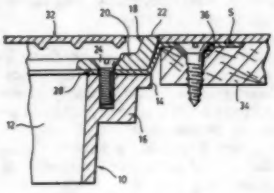
John E. Emberson, Markham, Canada, assignor to Espoco Limited, Scarborough, Canada

Filed Jan. 9, 1989, Ser. No. 294,704

Claims priority, application Canada, Jan. 14, 1988, 556558

Int. Cl.[5] E30F *5/02*

U.S. Cl. 210—164 **4 Claims**



1. A floor drain comprising:
a tubular body;
a grate frame secured to one end of said body;
a grate positioned by said grate frame to overlie said one end and said grate frame;
securing means for securing said body to said grate frame;
means having upper and lower surfaces and allowing said body to be secured to said grate frame by said securing means, said means extending outwardly of said grate frame at a location so that said lower surface overlies a floor deck, and being dimensioned so that the upper surface thereof is substantially level with floor placed on said floor deck.

4,943,101

WHEEL UNIT

Leonard T. Chapman, North Hollywood, Calif., assignor to Leonard Studio Equipment, N. Hollywood, Calif.

Filed Feb. 24, 1989, Ser. No. 314,947

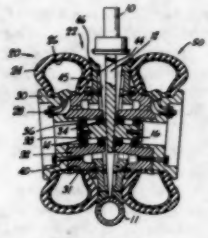
Int. Cl.[5] B60B *19/02*

U.S. Cl. 295—8.5 **10 Claims**

10. A ground and track camera dolly wheel unit comprising:
a rotatable king pin having a king pin blade;
first and second axles joined to said blade, said axles having

longitudinal axes mutually forming a dihedral angle therebetween;

first and second wheel assemblies each including a ground



wheel and a track wheel having a diameter less than that of said ground wheel;

said first and second ground wheel assemblies rotatably attached to said first and second axles respectively.

4,943,102

WINDSHIELD SUPPORTING STRUCTURE FOR A VEHICLE

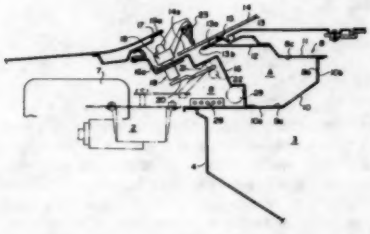
Masaya Hamamoto, and Kelichiro Shibata, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 25, 1989, Ser. No. 342,853

Claims priority, application Japan, Apr. 29, 1988, 63-106756

Int. Cl.[5] B62D *25/10*

U.S. Cl. 296—96.21 **19 Claims**



1. A windshield supporting structure, which is to be employed in combination with an open cowl structure having an opening which opens upward, includes a windshield supporting portion which is provided at the rear end portion of the opening to which the windshield is bonded, and is characterized in that said windshield supporting portion is positioned so that it supports the windshield at an intermediate portion thereof as viewed in the longitudinal direction of the vehicle body and so that the windshield extends forward and downward beyond the windshield supporting portion, said windshield supporting structure comprising a deformation control means which makes the part of the windshield extending forward and downward beyond the windshield supporting portion more bendable than the other part of the windshield.

4,943,103

REFLECTED GLARE-SHIELDING VEHICULAR APPARATUS

John B. Rosen, 2330 W. 27th, Eugene, Oreg. 97405

Filed Sep. 25, 1989, Ser. No. 412,176

Int. Cl.[5] G60J *3/00*

U.S. Cl. 296—97.1 **4 Claims**

3. Apparatus for shielding the eyes of a driver of vehicle from glare reflected from an exterior mirror of the vehicle in a reflected field of view along a line of sight between the driver and the mirror, wherein the reflected field of view defines a perimetral outline on a vehicle window, the apparatus comprising:

a reflected glare-attenuating expanse positionable along such line of sight, said expanse being substantially coextensive and shape-congruent with the perimetral outline on the vehicle window of the reflected field of view at a predetermined distance from the mirror and in a predetermined orientation relative thereto, and

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4,943,104

OPENING AND CLOSING CONTROLS OF ROOFS FOR VEHICLES

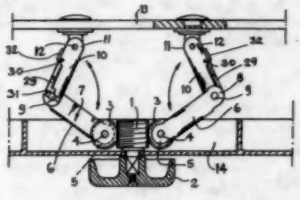
Bruno Zani, and Dullio Zani, both of Lumezzane, Italy, assignors to Zani S.r.l., Brescia, Italy

Filed Sep. 19, 1988, Ser. No. 246,515

Claims priority, application Italy, Sep. 25, 1987, 2935 A/87; Apr. 8, 1988, 2925 A/88

Int. Cl.[5] B60J *7/10*

U.S. Cl. 296—223 **13 Claims**



1. A device for controlling the opening and closing of the roof (13) of a vehicle, said roof having first pins (12) fixed thereto, comprising a worm screw (1) having a vertical axis and two opposite sides, two helical gears (3), having parallel horizontal axes (4), and being coupled to said opposite sides of said worm screw, two primary levers (6,6'), each primary lever having one end in engagement with each gear, a second pin projecting at the other end of each primary lever, secondary levers (10,10') pivotally connected and supported at one end to said second pin, the other end of each of said secondary levers being connected to each of said first pin, said primary and secondary levers forming an articulated pantograph structure, said worm screw when rotating moving said structure and causing said primary levers to assume a horizontal position when said roof is closed and when said roof is completely opened, said primary and secondary levers are raised and aligned.

4,943,105

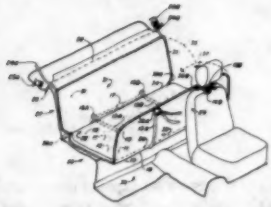
AUTOMOBILE PET SEAT AND CARGO CARRIER

David J. Kacar, and Cynthia R. Kacar, both of 1509 King St., Alexandria, Va. 22314

Continuation-in-part of Ser. No. 329,259, Mar. 27, 1989, abandoned, and Ser. No. 347,011, Jun. 16, 1989, abandoned. This application Aug. 23, 1989, Ser. No. 397,285

Int. Cl.[5] B60R *21/04*

U.S. Cl. 296—24.2 **10 Claims**



1. A device for supporting and protecting a pet or cargo in a back seat of a vehicle having a front seat defining a front seat, a back seat having a back upright portion and a back seat cushion having a slope and a back seat surface area, said vehicle further including a lower floor compartment behind the front seat, sa.d device comprising:

bottom rigid panel means for effectively extending the back seat surface area giving a pet or cargo a wider surface for comfort and stability during vehicle movement,

front rigid panel means for preventing a pet or cargo from falling forward into the front seat area past the front seat and from falling forward into the lower floor compartment,

and back soft panel means for protecting the back upright portion of the back seat,

said device further comprising mounting means for fastening the device to specific attachment points of the vehicle,

said front rigid panel means, bottom rigid panel means, and back soft panel means substantially covering the entire back seat, the lower floor compartment, and a back portion of the front seat,

said bottom rigid panel means and said front rigid panels means each comprising a fabric pouch means substantially enclosing a panel of rigid material.

4,943,106

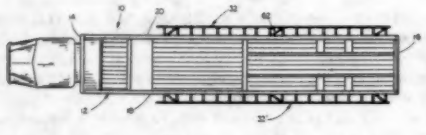
TRAILER HAVING SWING-OUT SIDE EXTENSIONS

William K. Hunt, Mitchell, S. Dak., assignor to Dakota Manufacturing Co., Inc., Mitchell, S. Dak.

Filed Jul. 24, 1939, Ser. No. 383,669

Int. Cl.[5] B62D *33/02*

U.S. Cl. 296—26 **3 Claims**



1. A trailer, comprising,

a wheeled frame means having a forward end, a rearward end, and opposite sides,

said frame means including first and second longitudinally extending side frame members,

and first and second swing-out side extension assemblies secured to said first and second side frame members respectively,

each of said swing-out extension assemblies comprising a plurality of horizontally disposed and horizontally spaced-apart elongated supports having one end thereof pivotally secured to the associated side frame member, and a rail member pivotally secured to the other ends of said supports,

the pivotal connection of said supports to said side frame and said rail member permitting said rail member to be selectively moved from an "in" position adjacent the associated frame member, to an "out" position spaced outwardly of the associated frame member,

means for selectively maintaining said rail member in its "in" position,

and means for selectively maintaining said rail member in its "out" position,

said means for selectively maintaining said rail member in its "in" position comprising at least one loop member secured to the inner surface of said rail member and a spring-loaded locking device operatively secured to the associated frame member which is adapted to engage said loop member and to lock thereonto when said rail member is moved from its said "out" position to its "in" position.

4,943,107

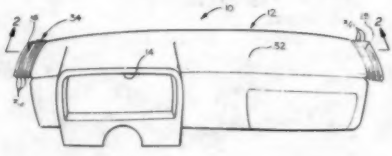
VARIATIONS ADJUSTMENT MECHANISM FOR INSTRUMENT PANELS

Richard D. Rhodes, Jr., Somersworth, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Jun. 30, 1989, Ser. No. 373,521

Int. Cl.[5] B62D *25/14*

U.S. Cl. 296—70 **15 Claims**



1. An instrument panel assembly for mounting between front support pillars of a vehicle, said assembly comprising:

a panel body with openings for supporting and displaying instruments and gages and extending transversely between two front support pillars of the vehicle, said panel body having first and second terminal ends;

said assembly characterized by said panel body including .an adjustment means disposed on at least one of said terminal ends of said panel body for adjustment between extended and compressed positions to provide flush engagement with at least one of the front support pillars of the vehicle.

4,943,108

PICK-UP TRUCK CAP

Steven Turnbull, P.O. Box 392, Pleasantville, N.Y. 10570

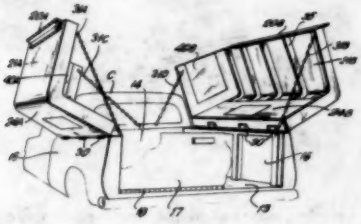
Filed Oct. 25, 1988, Ser. No. 261,846

Int. Cl.[5] B60P *7/02*

U.S. Cl. 296—100 **2 Claims**

1. A cap for mounting on the load bed of a pick-up truck, the bed having a floor, a pair of laterally extending end walls and a pair of side walls extending longitudinally on each side of the long axis of the truck, said cap comprising a roof, a pair of walls depending therefrom and extending longitudinally substantially coextensive therewith and at least one end panel extending, when said cap is mounted on the load bed, substantially coextensive with the end walls of the load bed, said roof and said cap side walls extending, when said cap is mounted on the load bed, substantially coextensive with the floor and side walls respectively of the load bed, said roof being split centrally longitudinally to provide substantially equal split cap halves, means for releasably securing said split cap halves

along the central longitudinal split line, hinge means for pivotally mounting the split cap halves to the side walls of the truck load bed the arrangement, including the weight distribution in said split cap halves and the length, width and height thereof, being such that said split cap halves are manually, freely pivotable away from the longitudinal split line to an open position



and means are provided for limiting the extent said cap split halves may be pivoted away from the longitudinal split line, whereby the floor of said road bed constitutes a work area when said cap split halves are opened, access means for entering and exiting said work area at an end of said cap and of said load bed.

4,943,109

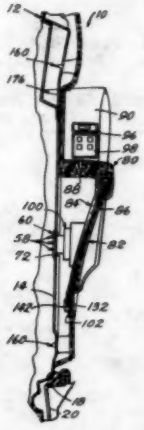
AUTOMOTIVE DOOR ASSEMBLY HAVING A PLUG-IN ELECTRIFIED INTERIOR PANEL

John R. Skrbina, Livonia, Mich.; Gregory A. Polityka, Oshawa, Canada, and Mark L. Smith, Livonia, Mich., assignors to Ford Motor Company, Newmarket, Mich. and Magna International, Inc., Ontario, Canada

Filed Aug. 9, 1988, Ser. No. 229,956

Int. Cl.[5] B60J *5/00*; H01R *13/642*

U.S. Cl. 296—146 **8 Claims**



1. An automotive door assembly comprising

a rigid frame structure defining the main body of the door assembly adapted to be mounted with respect to an automotive vehicle for movement between an open position and a closed position,

means including outer skin means fixed to an outer side of said rigid frame structure defining the exterior appearance of the door assembly,

means including panel means disposed on an opposite side of said rigid frame structure defining the interior appearance of the door assembly,

said rigid frame structure including a main sheet metal stamping providing a side wall portion disposed in spaced relation to said outer skin means, said side wall portion defining the opposite side of said rigid frame structure,

electrically operated means carried by said rigid frame structure between said exterior and interior appearance defining means,

said electrically operated means having current conductor means terminating in first current connector means,

means mounting said first current connector means in generally stationary relation with respect to said rigid frame structure,

said panel means being of substantial size and adapted to be moved into a predetermined operative position with respect to the opposite side of said rigid frame structure,

said panel means having opaque surface means so as to define the corresponding interior appearance of the door assembly,

said panel means comprising a molded laminate including a first layer containing said opaque surface means and a second layer of a rigid foamed plastic material,

electrical harness means carried by said panel means for transmitting electrical current sources from outside of said door assembly therethrough,

said electrical harness means terminating in second current connector means,

means mounting said second current connector means in generally stationary relation on said panel means,

said first and second current connector means including one of male elements and female elements adapted to be interengaged in response to the movement of said panel means into the operative position thereof,

said mounting means being operable with respect to at least one of the male and female elements of said first and second current connector means to accommodate limited relative movement between one of said male and female elements and said mounting means in a direction transverse to the longitudinal direction of the male of said elements so as to insure that the male and female elements of the first and second current connector means are interengaged during the movement of said panel into the operative position thereof,

said side wall portion of said rigid frame structure including first guide means,

said panel means having second guide means,

said first and second guide means being operable to interengage during the movement of said panel means into the operative position thereof with respect to the opposite side of said rigid frame structure so as to guide said panel means into said operative position during such movement, and

means for securing said panel means to said rigid frame structure in said operative position,

said first current connector means including a first current connector comprising a first body of molded plastic material containing one of said elements,

the mounting means for said first current connector comprising a connector opening in said side wall portion and integral surface means molded in an associated first body operable to grippingly engage the sheet metal of said side wall portion defining an associated connector opening when the associated first body is moved into an operative position within the associated first opening,

said second current connector means including a second current connector comprising a second body of molded plastic containing the associated interengaging element,

the mounting means for said second current connector comprising a connector fitment molded in embedded relation in the second layer of said panel means,

said connector fitment having a first mounting surface facing in a direction away from said opaque surface means, a second mounting surface parallel with and facing toward

said first mounting surface and stop surfaces extending transversely with respect to said first and second mounting surfaces,

an associated second body being mounted within said fitment between said first and second mounting surfaces so that the movement of the associated second body with respect to said fitment is generally restricted to movement in the direction of the parallel extent of said second mounting surface and engagement of the stop surfaces of said fitment with the associated second body limits the amount of movement in the direction of parallel extent of said second mounting surface which can take place.

4,943,110

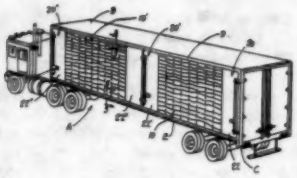
CURTAINSIDE TRUCK TRAILER ACCESS SYSTEM AND LOCK ASSEMBLY

John V. Pastva, Parma Heights, Ohio, assignor to The Eastern Company, Cleveland, Ohio

Continuation of Ser. No. 53,278, May 21, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,787

Int. Cl.[5] B60J *5/06*

U.S. Cl. 296—181 **5 Claims**



1. A roller mechanism and rail combination of the type used to close a truck trailer opening, said roller mechanism comprising a plate for attachment to a closure panel, top and bottom roller members attached to said plate each rotating about a central axis extending at a right angle from the plate, a peripheral groove in each roller member to receive a rail attached to the truck trailer, said rail comprising a flange T-shaped in cross section extending between the top and bottom roller members and receivable within the peripheral groove of each said roller member and a flange L-shaped in cross section spaced from and parallel with the T-shaped flange and receivable within the peripheral groove of the bottom roller member.

2. A swivel mechanism of the type used to support a closure panel over a truck trailer opening and engaged with a rail member, said mechanism comprising:

a housing attached to the closure panel comprising an access aperture and a containment portion, and a longitudinal spring assembly comprising an elongated fastener and a surrounding compression spring;

a roller rotatable about a central axis at right angles with the housing;

means including an interconnecting member rotatably supporting the central axis of the roller and securing the roller to the housing and spring assembly for relative swivel movement and relative rectilinear movement of the housing and attached panel with respect to the roller and a rail member; and

said fastener including a first end attached to the interconnecting member, a body portion extending through the access aperture to the containment portion and along the length of the compression spring located within the containment portion, and a second end spaced from the first end enlarged to confine the compression spring within the containment portion.

4,943,111

CONTAINER HOLDER FOR A VEHICLE

Kenneth J. VanderLaan, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Jul. 26, 1988, Ser. No. 225,083

Int. Cl.[5] A47C *7/62*

U.S. Cl. 297—194 **21 Claims**

1. A vehicle armrest and container holder assembly comprising:

an armrest for mounting to a vehicle; and

a container holder and means for mounting said holder to said armrest, said holder including a first container supporting member having a first vertical member and a first set of a plurality of arms extending in a generally horizontal plane in a direction away from said vertical member and from said armrest, said holder further including a second supporting member having a second vertical member and a second set of a plurality of arms extending in a direction away from said second vertical member and toward said armrest; said first and second set of arms being positioned and shaped to telescope one set with respect to the other so as to provide a plurality of spaced-apart positions of said first and second vertical members such that facing edges of each of said vertical members of said supporting members can be spaced apart a selectable distance for holding different sized containers; said first and second sets of telescoping arms defining a floor means for supporting a container.

4,943,112

CHILD'S COLLAPSIBLE CAR SEAT

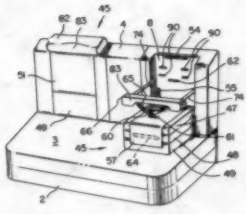
Norman Law, 6 Galloway Road, Sherwood Park, Alberta, Canada T8A 3K8

Filed Aug. 1, 1989, Ser. No. 387,782

Claims priority, application Canada, Aug. 4, 1988, 573895

Int. Cl.[5] A47C *15/00*

U.S. Cl. 297—238 **9 Claims**



1. A collapsible child's seat device for use in a conventional automobile seat of the type including a seat portion and a backrest, said device comprising a plurality of panel means for defining a child's seat and a backrest; an elongated strip of fabric pivotally interconnecting said panel means in end-to-end relationship to each other in the stored position, in which said panel means are disposed in a recess in the automobile seat backrest and define a planar front portion of such backrest, one end of said strip being pivotal connected to the automobile seat at the junction between the seat portion and the backrest,

whereby said panel means can be folded into overlapping relationship in the use position in which the panel means is folded onto the automobile seat portion to define a child's seat raised above the level of the automobile seat portion; first catch means on the top free end of said panel means and on the backrest for releasably retaining said panel means in the stored position; cover means attached at one end to the seat backrest for extending over said panel means in the use position; cover means and crotch strap means attached at one end to the seat backrest; said cover means and said crotch strap means being covered by said panel means in the stored position; and first connector means on said backrest releasably connecting the other end of each said cover means and crotch strap means to the beckrest while in the stored position; in the use position said crotch strap means extending over said panel means beneath said cover means and through the cover means near the front thereof whereby the other end of the crotch strap may be connected to a conventional vehicle seat belt.

4,943,113

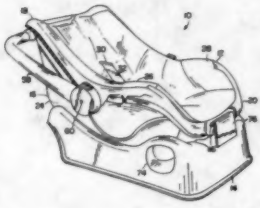
CHILD RESTRAINT SYSTEM WITH IMPROVED BASE

Paul K. Meeker, Aurora, Ohio, assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.

Filed Feb. 24, 1989, Ser. No. 315,012

Int. Cl.[5] A47D *1/10*

U.S. Cl. 297—250 **7 Claims**



1. A restraining system for a child comprising in combination:

an infant carrier having a foot end and a head end and side edges therebetween, the carrier having finger receiving slots in its lower face;

a base having a foot end and a head end and side edges therebetween, and pivotable fingers extending upwardly from the upper surface of the base adjacent to the side edges thereof adapted to releasably receive in the slots for thereby coupling the carrier to the base; and

an inverted J-shaped hook in the base at the foot end for receiving the foot end of the carrier and cooperable with the fingers for securely holding the carrier with respect to the base at triangularly spaced points.

4,943,114

CHAIR BACKREST LINKAGE MECHANISM

Giancarlo Piretti, Via Trento e Trieste 2/2, Bologna, Italy

Filed Feb. 6, 1989, Ser. No. 307,005

Int. Cl.[5] A47C *1/032*

U.S. Cl. 297—301 **13 Claims**

1. A backrest linkage mechanism comprising:

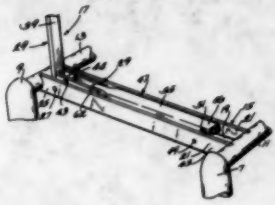
a. an elongated frame;

b. a backrest lever having a first end pivotally mounted to the frame and a second end;

c. a seat lever having a first end pivotally mounted to the frame and a second end;

d. an anti-friction sliding joint connecting the second ends of the backrest lever and the seat lever; and

e. spring means acting between the frame and at least one of the backrest lever and seat lever for biasing the backrest lever and seat lever to a normal configuration whereat the second end of at least one of the backrest lever and the seat lever is in abutting contact with the frame to locate the backrest lever and the seat lever in their respective normal configurations and whereat the seat lever and backrest lever are generally coplanar,



whereby exerting a force on the backrest lever against the spring means causes the backrest lever and the seat lever to pivot about the frame to a tilted configuration whereat the backrest lever and seat lever are non-coplanar.

4,943,115

SWIVEL CHAIR WITH ADJUSTABLE BACK REST

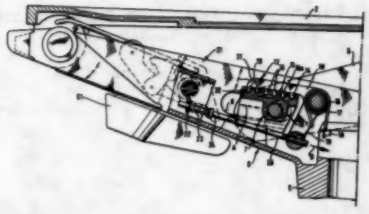
Felix Stucki, Thunstetten, Switzerland, assignor to Girsberger Holding AG, Blitzberg, Switzerland

Continuation of Ser. No. 262,101, Oct. 18, 1988, abandoned, which is a continuation of Ser. No. 92,328, Sep. 2, 1987, abandoned. This application Aug. 29, 1989, Ser. No. 401,471

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629882

Int. Cl.[5] A47C *1/032*

U.S. Cl. 297—301 **18 Claims**



1. A chair comprising a leg including a support having first and second carriers; a seat on said first carrier; a back rest on said second carrier; and means for movably coupling said carriers to each other, including a slotted portion provided on one of said carriers, a slide portion provided on the other of said carriers and movable in said slotted portion between a plurality of positions in and counter to a predetermined direction, and detent means including cooperating first and second detent elements which are movable relative to each other and are respectively provided on said slide portion and said one carrier and have means for releasably holding said slide portion in selected ones of said plurality of positions.

4,943,116

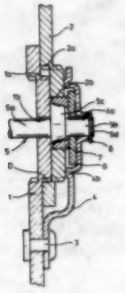
RECLINING ANGLE ADJUSTMENT DEVICE

Akira Ohwada; Masanori Sakai, and Yasuhisa Tsutsumi, all c/o Shiroki Kinzoku Kogyo Kabushiki Kaisha, 2 Kirihara-cho, Fujisawa-shi, Kanagawa-ken 252, Japan

Continuation of Ser. No. 138,083, Dec. 28, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 307,165

Int. Cl.[5] B60N *2/02*

U.S. Cl. 297—362 **3 Claims**



1. A reclining angle adjustment device for a seat, comprising:

a shaft having a concentric portion and an eccentric portion and rotatable for adjusting the reclining angle of the seat;

a tapered bushing having a tapered inner peripheral surface engaging said eccentric portion of the shaft;

a gear train including an external gear and an internal gear meshing with said external gear, said internal gear having more teeth than said external gear;

a first arm having one of said external and internal gears, said one of the external and internal gears being rotatably fitted at its center over said concentric portion;

a second arm having the other of said external and internal gears, said other of the eternal and internal gears being rotatably fitted at its center over said tapered bushing; and

a resilient member engaging said tapered bushing for normally pressing the tapered bushing axially along said shaft in a direction to strengthen meshing engagement between said external and internal gears.

4,943,117

BODY WEIGHT DISTRIBUTION SUPPORT CHAIR

Shawn W. Brown, 11590 Lazy Valley Rd., Penn Valley, Calif. 95946

Filed Jul. 24, 1989, Ser. No. 383,545

Int. Cl.[5] A47C *1/10*

U.S. Cl. 297—392 **19 Claims**

1. A comfort chair for use at computer terminals, which chair has no back and which comprises:

a. a superstructure,

b. a seat portion,

c. a head-chest portion which is faced by a user, each of said seat portion and said head-chest portion being supported by the superstructure and each being spaced from the other portion on said superstructure,

said superstructure formed from a plurality of interconnected tubes comprising a pair of spaced front legs and a pair of spaced rear legs,

said front legs being connected to said rear legs by a pair of rearwardly converging upwardly directed connecting posts and by a pair of curved seat joiner tubes;

a pair of leg bars, one of which extends outwardly from each of said front legs, and

wherein the seat portion is mounted upon said seat joiner tubes and wherein the front legs each have a generally vertical base section and an upwardly inclined second section commencing therefrom, and a generally vertical third section, said second sections being joined by a horizontal bar, and the spacing between the two front legs is less than the spacing between the two rear legs at their locus of contact with the ground.

4,943,118

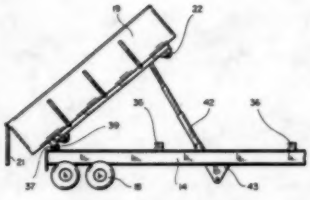
END DUMPING TRAILER

Louis Davis, 4501 North Washington, Turlock, Calif. 95380

Filed Mar. 7, 1989, Ser. No. 320,703

Int. Cl.[5] B60P *1/28*

U.S. Cl. 298—12 **12 Claims**



1. In an end dumping trailer: an elongated frame supported toward the rear by ground engaging wheels, a single nontelescoping bed substantially shorter than the frame mounted on the frame for movement between a travelling position in front of the wheels and a dumping position toward the rear of the frame, hook and pin means affixed to the rear portions of the bed and the frame for limiting rearward movement of the bed and providing a pivoting connection between the bed and the frame when the bed is in the dumping position, and means for tilting the bed about the pivoting connection for dumping to the rear of the frame when the bed is in the dumping position.

4,943,119

HEIGHT CONTROL DEVICE AND METHOD FOR A FIXTURE FOR MACHINING AN OBJECT ESSENTIALLY DEFINED BY A SINGLE PLANE

Martin Zarniko, Diez, and Willibald Sehr, Waldbrunn-Ellar, both of Fed. Rep. of Germany, assignors to MOBA - Electronic, Fed. Rep. of Germany

Filed Nov. 22, 1988, Ser. No. 274,831

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1988, 8810670[U]

Int. Cl.[5] E01C *23/08*; G01S *15/08, 15/88*

U.S. Cl. 299—1 **10 Claims**

1. A height control device for a fixture for machining an object essentially defined by a single plane by means of a machining tool for changing the level height of the plane, in particularly for a milling fixture for stripping road surfacing comprising:

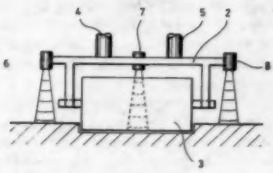
a first gauging device featuring a first ultrasonic transceiver for gauging the distance from the ultrasonic transceiver to the unmachined plane of the object,

a second gauging device featuring a second ultrasonic transceiver for gauging the distance from the second ultrasonic transceiver to the machined plane,

a signal generator connected to both gauging devices for generating a first signal representing the change in the level height due to machining from the quotient or difference of the distances measured by said first and second gauging devices, and

a control device for elevating or lowering the machining fixture so that the signal representing the change in the level height due to machining essentially corresponds to a setpoint value for changing the level height due to machining.

6. A method for providing a height control device for a fixture for machining an object essentially defined by a single



plane by means of a machining tool for changing the level height of the plane, in particularly for a milling fixture for stripping road surfacing comprising the steps of:

providing a first gauging device featuring a first ultrasonic transceiver for gauging the distance from the ultrasonic transceiver to the unmachined plane of the object;

providing a second gauging device featuring a second ultrasonic transceiver for gauging the distance irom the second ultrasonic transceiver to the machined plane;

providing a signal generator connected to both gauging devices for generating a first signal representing the change in the level height due to machining from the quotient or difference of the distances measured by said first and second gauging devices; and

providing a control device for elevating or lowering the machining fixture so that the signal representing the change in the level height due to machining essentially corresponds to a setpoint value for changing the level height due to machining.

4,943,120

FORCE TRANSMITTING HOUSING FOR LONGWALL MINING MACHINE

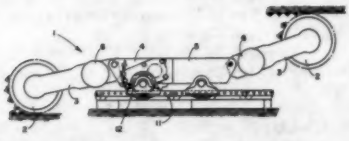
Hans Groger, Essen, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik u. EisengieBerei, Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 199,390

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1987, 3718442

Int. Cl.[5] E21C *29/22, 29/28*

U.S. Cl. 299—42 **12 Claims**



1. A drum-cutter mining machine for longwall mining operations in which the drum-cutter mining machine is translatable along a longwall conveyor, said mining machine including:

a machine body;

a capstan supported from said machine body, said capstan supporting internal drive motor means and said capstan forming a vertically extending sidewall positioned above the longwall conveyor;

a recessed area forming a cavity on said sidewall of the capstan;

an aperture extending through the recessed area of the sidewall for allowing an output shaft butt of the drive motor means to extend therethrough;

a housing removably positioned in the recessed area of the sidewall, said housing forming an enclosed area therein;

means for fastening the removable housing to the sidewall of the capstan in a plurality of desired orientations;

gear means positioned in said enclosed area connected with the output shaft butt of the drive motor means; and

drive wheel means connected with said gear means and positionable to engage a conveyance means to allow translation of the mining machine therealong.

4,943,121

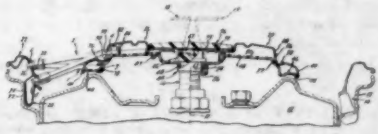
WHEEL TRIM

Heinrich J. Hempelmann, Livonia, Mich., assignor to Ni Industries, Inc., Novi, Mich.

Filed Jan. 19, 1988, Ser. No. 145,513

Int. Cl.[5] B60B *7/06*

U.S. Cl. 301—37 SS **17 Claims**



1. In a simulated wire wheel trim of the type including an outer annular ring assembly, a center hub assembly, and a plurality of generally radially extending spokes the inner and outer radial ends of each engaging a respective assembly, said center hub assembly comprising a rotatable retention member for engaging the vehicle wheel, an axially inner spoke retainer plate, an axially outer spoke retainer plate, and means for securing said spoke retainer plates together characterized in that said axially inner spoke retainer plate has integrally formed therewithin means engageable with said rotatable retention member for inhibiting rotation of said retention member relative to said vehicle wheel.

4,943,122

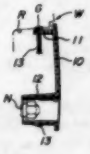
CENTER HUB CAP FOR VEHICLE WHEELS

Takao Nakamura, Yokohama, Japan, assignor to Hashimoto Forming Industry Co., Ltd., Yokohama, Japan

Filed Aug. 30, 1989, Ser. No. 400,687

Int. Cl.[5] B60B *7/06*

U.S. Cl. 301—108 A **7 Claims**



1. A center hub cap for use with a vehicle wheel which is to be secured to a hub of a vehicle, and which includes a center

portion recessed from an axially outer surface side of the wheel and defined by an inner peripheral wall, said center portion having a bottom wall with an axially inner surface to be brought into abutting engagement with an axially outer surface of said hub, said bottom wall of the wheel being adapted to be secured to said hub by a plurality of fastener elements through said wall; wherein said center hub cap is adapted to be engaged with said inner peripheral wall of the center portion of the wheel, and comprises:

[A] a substantially dish-like main body composed of a synthetic resin material, and having axially inner and outer surfaces;

[B] a plurality of hollow, substantially cylindrical projections formed integrally with said main body to protrude axially inwardly from said inner surface of the main body, and adapted to accommodate therein respective heads of said fastener elements;

[C] retainer means for retaining the hub cap in engagement with the wheel, including (i) a plurality of retainer legs which are formed integrally with said main body to protrude axially inwardly from the inner surface of said main body, and arranged between neighboring pair of said cylindrical projections, and (ii) an annular spring ring composed of a resilient material for resiliently urging said retainer legs radially outwardly of said main body toward said inner peripheral wall of the center portion of the wheel; and

[D] means for axially maintaining said spring ring in engagement with said retainer legs, including shoulder portions on those outer peripheral surface regions of respective projections which are arranged radially outwardly of said main body, each shoulder portion being adapted to radially support said spring ring between two neighboring retainer legs.

4,943,123

BRAKE CONTROL APPARATUS IN DIAGONAL BRAKING HYDRAULIC PRESSURE SUPPLY SYSTEM FOR USE IN MOTOR VEHICLES

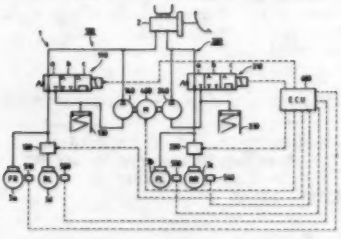
Kenji Takeda, Okazaki; Sigeru Kamiya, Aichi; Satosi Suzuki, and Yasuhisa Yoshino, both of Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Oct. 7, 1988, Ser. No. 254,607

Claims priority, application Japan, Oct. 8, 1987, 62-254324

Int. Cl.[5] B60T *8/26, 8/32*

U.S. Cl. 303—111 **9 Claims**



1. A brake apparatus for use in a motor vehicle having at least one front-side wheel and at least one rear-side wheel, comprising:

hydraulic pressure supply passage means provided between a master cylinder of said vehicle which generates a hydraulic pressure in response to an operation of a braking pedal of said vehicle and wheel braking cylinders which apply braking forces to said front-side wheel and said rear-side wheel, said hydraulic pressure supply passage means including first to third hydraulic passages such that the hydraulic pressure from said master cylinder is supplied through said first hydraulic passage and then reaches said front-side wheel braking cylinder through said second hydraulic passage and reaches said rear-side wheel braking cylinder through said third hydraulic passage;

first speed sensor means for sensing a speed of said front-side wheel;

second speed sensor means for sensing a speed of said rear-side wheel;

hydraulic pressure adjusting means provided in said first hydraulic passage for adjusting the hydraulic pressure to be applied to said front-side and rear-side wheel braking cylinders in accordance with a brake control signal;

proportioning value means provided in said third hydraulic passage for controlling the hydraulic pressure to be applied to said rear-side wheel braking cylinder in accordance with a predetermined proportional characteristic of said proportioning valve means, said predetermined proportional characteristic being such that the hydraulic pressure applied to said wheel braking cylinder is approximately equal to the hydraulic pressure supplied from said hydraulic pressure adjusting means when the applied hydraulic pressure is below a predetermined pressure value, and the applied hydraulic pressure is less than the hydraulic pressure supplied from said hydraulic pressure adjusting means by a predetermined ratio when said applied hydraulic pressure exceeds said predetermined pressure value, said proportioning value means being adapted to vary said predetermined proportional characteristic to change said predetermined ratio in accordance with a ratio control signal such that said predetermined pressure value is reduced; and

electric control means for supplying said hydraulic pressure adjusting means with said brake control signal determined on the basis of the speeds of said front-side and rear-side wheels sensed by said first and second speed sensor means and supplying said proportioning valve means with said ratio control signal determined as a function of information representing an excessive degree of the hydraulic pressure to said rear-side wheel braking cylinder, said information being obtained on the basis of the speeds of said front-side and rear-side wheels sensed by said first and second speed sensor means;

wherein said proportioning valve means comprises:

a housing including therein a spool chamber, a first path connecting said spool chamber to the master cylinder side of said third passage, and a second path connecting said spool chamber to the wheel braking cylinder side of said third passage;

a spool slidably encased in said spool chamber, said spool being biased by spring means in one direction so that said first and second paths are communicated with each other; and

electromagnetic coil means responsive to said ratio control signal from said control means for moving said spool in the direction opposite to the biasing direction so as to allow cutting off the communication between said first and second paths.

4,943,124

ASHTRAY FOR VEHICLES

Günter Dietz; Volker Dabringhaus, and Peter Wegel, all of Wuppertal, Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Jul. 31, 1989, Ser. No. 388,015

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1988, 3825828

Int. Cl.[5] E05C *7/06*

U.S. Cl. 312—222 **16 Claims**

1. A container in the form of a drawer with an unlocking mechanism, comprising:

a housing having a front opening for receiving a drawer, and

a drawer movable into and out of the front opening in the housing;

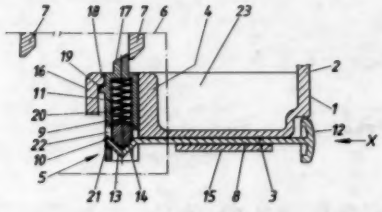
the drawer having a front wall facing out of the housing and having a rear wall spaced from the front wall and further in the housing, and the drawer having a bottom joining the front and rear walls thereof;

a stop in the housing extending in the housing toward the drawer;

an unlocking mechanism supported by the drawer operated in cooperation with the stop to prevent withdrawal of the drawer from the housing beyond a predetermined extent determined by the location of the stop and the unlocking mechanism being operable to permit withdrawal of the drawer from the housing beyond the predetermined extent; the unlocking mechanism comprising:

a slide supported by the drawer, the slide including a bolt operating portion extending rearwardly of the drawer, the slide being moveable forwardly and rearwardly with respect to the drawer and the housing;

a bolt supported on the drawer and being movable in a first direction into engagement with the stop on the housing



and being movable in an opposite second direction out of engagement with the stop on the housing; a push element connected with the bolt and movable into and out of engagement with the bolt operating portion of the slide; spring means between the push element and the bolt for urging the push element against the bolt operating portion of the slide, and the bolt and push element being so shaped and positioned that the push element presses upon the bolt operating portion of the slide at one side of the slide, while the bolt engages the bolt operating portion of the slide from the opposite side of the slide;

where the bolt engages the bolt operating portion of the slide, and where the push element, engages the bolt operating portion of the slide, being respectively so shaped that upon movement of the slide in one direction with respect to the drawer, the cooperation between the slide and the bolt moves the bolt in the one direction out of position to abut the housing stop while the slide engages the push element to push the push element in the opposite direction and further biases the spring means to urge the bolt toward the position where it would normally abut the housing stop.

4,943,125

SOLAR COLLECTOR

John W. Laundre', 2865 Janet, Pocatello, Id. 83201; Timothy D. Reynolds, 190N 680 W, Blackfoot, Id. 83221, and Mary B. Reynolds, 11372 W. Whispering Cliffs Dr., Chubbuck, Id. 83202

Filed Jan. 26, 1989, Ser. No. 301,877

Int. Cl.[5] G02B *6/00*

U.S. Cl. 350—96.1 **8 Claims**

1. An apparatus for the collection and transmission of incident electromagnetic energy, comprising:

a housing assembly;

said housing assembly including a curved structured with opposed interior and exterior surfaces;

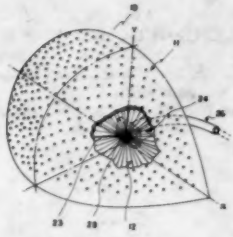
said housing assembly defining an interior cavity;

a plurality of optic fiber pores included in said exterior surface of said curved structure and disposed therethrough;

a plurality of optic fibers which extend from said exterior surface of said optic fiber pores to a central location within said interior cavity;

an assemblage of optic fiber segments within said interior cavity at said central location;

a means for providing an exit aperture at said assemblage of



said optic fiber segments for the collection and concentration of said optic fibers;

an optic fiber clamping means for the collection, gathering, and holding fixed said optic fibers;

an energy transmission means attached to said housing assembly;

a coupling means for the connection to said energy transmission means providing for the distribution of said incident electromagnetic radiation to predetermined application.

4,943,126

REPLICATION OF CARRIERS BEARING DIGITALLY RECORDED INFORMATION

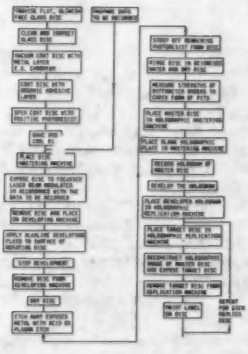
Anthony Lang, Surrey, England, and Paul Bloch, deceased, late of Oxfordshire, England (by Linda R. Bloch, legal representative), assignors to Thorn EMI plc, London, United Kingdom

Continuation of Ser. No. 129,553, Dec. 7, 1987, abandoned. This application Sep. 18, 1989, Ser. No. 408,947

Claims priority, application United Kingdom, Dec. 6, 1986, 8629223

Int. Cl.[5] G03H *1/22, 1/20;* G11C *13/04*

U.S. Cl. 350—3.69 **8 Claims**



6. A method for the replication of carriers bearing digitally recorded information comprising:

(a) forming a transparency bearing a digital pattern representative of the digitally recorded information;

(b) illuminating said transparency so as to form a hologram

recorded with a holographic representation of said digital pattern; and

(c) illuminating said hologram so as to form a digital representation of said digitally recorded information on one or more photo-sensitive carriers.

4,943,127

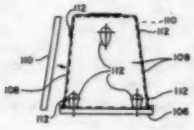
MULTI-FACETED OPTICAL DEVICE FOR LASER SCANNER

William C. McRight, Round Rock, Tex., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Dec. 20, 1988, Ser. No. 287,095

Int. Cl.[5] G02B *26/10*

U.S. Cl. 350—6.8 **7 Claims**



1. A multi-faceted optical device for use in a laser scanner wherein the optical device is rotated about a central axis for rotational movement through a repetitive cycle to reflect and sweep a laser beam through a desired optical space, said multi-faceted optical device comprising:

a body member formed of plastic material, said body member being shaped to be rotated about said central axis and to define two or more mirror receiving faces;

two or more mirrors shaped to be received upon said mirror receiving faces of said body member;

pad means formed into said mirror receiving faces for locating said two or more mirrors upon said mirror receiving faces in a defined orientation relative to said central axis; and

fast setting adhesive securing said mirrors to said mirror receiving faces.

4,943,128

LIGHT SCANNING DEVICE

Hiromi Takada; Takami Suzuki, both of Yokohama; Toshio Shiina, Kawasaki; Keiji Okamoto; Takeshi Komurasaki, both of Yokohama; Satoru Yoshioka, Kamakura; Nobuo Sakuma, Inagi, and Tadashi Matsuura, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

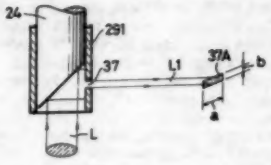
Filed Oct. 28, 1987, Ser. No. 113,668

Claims priority, application Japan, Oct. 28, 1986, 61-256133; Jun. 5, 1987, 62-141120; Jun. 5, 1987, 62-141121; Jun. 9, 1987, 62-143510; Jun. 10, 1987, 62-144588; Jun. 30, 1987, 62-163695; Aug. 7, 1987, 62-197338; Aug. 7, 1987, 62-197339

Int. Cl.[5] G02B *26/10*

U.S. Cl. 350—6.9 **16 Claims**

1. A light scanning device comprising a mirror surface inclined to an axis of rotation for deflecting and scanning an incident beam of a nearly elliptical cross-section applied across the axis of rotation over a scanning line in a main scanning direction in response to rotation of said mirror surface, and shaping means for shaping the nearly elliptical cross-section of said incident beam in order to prevent its direction from being changed on the scanning line irrespective of the rotation of said mirror surface, wherein said scanning line is applied to a photo-



sensitive member and wherein a focusing lens is positioned between said shaping means and said photosensitive member.

4,943,129

TAPERED OPTICAL WAVEGUIDE, WAVEGUIDE TYPE OPTICAL HEAD USING SAME AND OPTICAL WAVEGUIDE

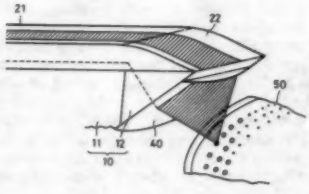
Tadashi Takeda, Komagane; Noboru Ueno, Suwa, and Yasumitsu Miyazaki, Nagoya, all of Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Mar. 30, 1989, Ser. No. 331,633

Claims priority, application Japan, Mar. 31, 1988, 63-79854; Mar. 31, 1988, 63-79855

Int. Cl.[5] G02B *6/12*

U.S. Cl. 350—96.12 **14 Claims**



7. A waveguide type optical head, comprising:

a substrate having a plane surface for forming a waveguide layer, whose refractive index is higher than that of said substrate, which substrate is transparent with respect to guided light, and

a waveguide layer formed on said plane surface of said substrate;

wherein said waveguide layer includes a uniform thickness waveguide layer having a uniform layer thickness and a tapered waveguide disposed contiguously to said uniform thickness waveguide layer, forming a joint portion therebetween, so that said guided light propagating in a propagation direction in said uniform thickness waveguide layer is emitted there towards said substrate, which tapered waveguided has the same layer thickness as said uniform thickness waveguide layer at said joint portion and has a

thickness which decreases gradually with increasing distance from said joint portion;

wherein said waveguide layer is provided with a lens having a converging action in the width direction of said waveguide layer and constructed so as to converge the emitted light beam emitted by said tapered waveguide layer towards the substrate side to form a small spot on an optical disc; and

wherein said substrate includes a propagation substrate and an emission substrate each having thereon a portion of said plane surface for forming the waveguide layer, said propagation substrate and said emission substrate being disposed so as to be contiguous to each other in the propagation direction, said emission substrate having a refractive index greater than that of said propagation substrate, and a joint portion between said propagation substrate and said emission substrate being located so that it is close to an emission starting position determined by the refractive indices of said propagation substrate and said waveguide layer as well as the shape of said tapered optical waveguide and so that it is not beyond said emission starting position in the waveguide direction.

4,943,130

INTEGRATED OPTICAL COMPONENT

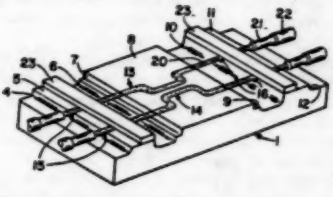
Thierry L. Dannoux, 8 rue Saint Louis, 77300 Fontainebleau; Pierre J. Laroulandie, 70 rue Bernard Palissy, 77210 Avon, and Jean-Pierre Themont, 19, rue des Housseaux, 77690 Montigny-Sur-Loing, all of France

Filed Mar. 10, 1988, Ser. No. 166,388

Claims priority, application France, Mar. 12, 1987, 87 03385

Int. Cl.[5] G02B *6/12*

U.S. Cl. 350—96.12 **14 Claims**



1. An integrated optical component comprising a glass substrate with at least one ion diffused optical circuit path connected to at least one optical fiber and further comprising:

at least one transverse exit groove (6,10) forming a vertical lateral surface (7) at a termination of said optical circuit path, an endface of said optical fiber abutting said termination at said vertical lateral surface;

plateau support means (5,11) adjacent the side of said transverse exit groove opposite said optical circuit path, for supporting an uncoated portion of said optical fiber;

second support means (4,12) adjacent the side of said plateau support means opposite said optical circuit path, for supporting a coated or sheathed portion of said optical fiber; and,

first adhesive means for securing said optical fiber endface to said vertical lateral surface.

4,943,131

THIN-FILM OPTICAL FUNCTION ELEMENT, AND OPTICAL HEAD USING THE SAME

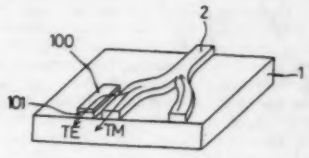
Kazunari Taki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 24, 1988, Ser. No. 261,232

Claims priority, application Japan, Oct. 30, 1987, 62-277009

Int. Cl.[5] G02B *6/12*

U.S. Cl. 350—96.12 **6 Claims**



1. A thin-film optical function element, comprising:

a substrate formed of a dielectric material;

a first optical waveguide consisting of a thin film of a dielectric material formed on said substrate, said first optical waveguide having a substantially same propagation constant with respect to two different modes which have field patterns whose vibrating directions are perpendicular to each other; and

a second optical waveguide consisting of another thin film of another dielectric material formed on said substrate, said second optical waveguide being optically coupled to said first optical waveguide, and guiding therethrough only one of said two different modes.

4,943,132

PASSIVE FIBER-OPTIC POLARIZATION CONTROL

Hung-chia Huang, Jiang Ning Road, 83 Lane, No. 4, Suite 404, Shanghai, China

Filed Feb. 16, 1989, Ser. No. 310,872

Claims priority, application China, Oct. 23, 1988, 88107389.X

Int. Cl.[5] G02F *1/19*

U.S. Cl. 350—96.13 **7 Claims**

1. A method of controlling, in a purely passive way, an unpredictable orientation of a linearly polarized light in a single mode optical fiber, comprising:

providing a media having two orthogonal preferred modes of polarization,

providing a coupling, between said modes of polarization, with variable strength along the transit path of light,

said coupling having a strong initial strength and gradually decreasing to zero along the transit path of light, so that initially the powers of the two modes undergo a fast oscillating process of conversions and reconversions, along the transit path of light, with almost equal amplitudes of the rises and falls of the mode powers from an average value, until gradually, because of decrease in coupling strength, these rises and falls subside to reach an eventual state of almost equal division of power between the polarization modes.

4,943,133
LOW LOSS SEMICONDUCTOR OPTICAL PHASE MODULATOR

Robert J. Deri, Atlantic Highlands, and Elyahou Kapon, Old Bridge Township, Middlesex County, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

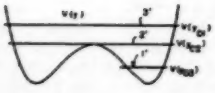
Filed Aug. 8, 1988, Ser. No. 229,233
Int. Cl.[5] G02B 6/10; G02F 1/00
U.S. Cl. 350—96.14 **16 Claims**

11. A semiconductor waveguide modulator comprising a GaAs substrate having thereover sequential epitaxial layers comprising aluminum gallium arsenide and gallium arsenide including a first doped aluminum gallium arsenide electrode layer, a first effective intrinsic aluminum gallium arsenide confinement layer, an intrinsic gallium arsenide waveguide layer, a second effective intrinsic aluminum gallium arsenide confinement layer and a second doped aluminum gallium arsenide electrode layer wherein one of said electrode layers is doped with an n-type dopant, and the other with a p-type dopant, and wherein the index of refraction of the two confinement layers are significantly lower than the index of refraction of said waveguide layers and the index of refraction of said first electrode layer is higher than that of said first confinement layer, said layered structure being assymetric and wherein during operation the E-field of the guided wave is confined so as to essentially not overlap said electrode layers.

4,943,134
COUPLER

Brian P. Nelson, Woodbridge, England, assignor to British Telecommunications, Public Limited Company, London, England

PCT No. PCT/GB88/00154, § 371 Date Nov. 22, 1988, § 102(e) Date Nov. 22, 1988, PCT Pub. No. WO88/06747, PCT Pub. Date Sep. 7, 1988
PCT Filed Mar. 2, 1988, Ser. No. 278,439
Claims priority, application United Kingdom, Mar. 6, 1987, 8705272
Int. Cl.[5] G02B 6/26
U.S. Cl. 350—96.13 **15 Claims**



11. An optical coupler comprising:

an inner cylindrical waveguide portion comprising non-linear refractive index material supporting first mode fields, said inner waveguide portion exhibiting a non-linear reaction with itself having a particular overlap integral value; and

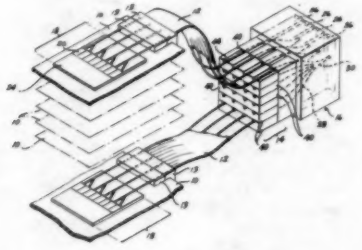
an outer tubular cylindrical waveguide portion, coaxial with and enclosing said inner waveguide portion, said outer waveguide portion comprising non-linear refractive index material supporting second mode fields different from said first mode fields, said outer waveguide portion exhibiting a non-linear reaction with itself having a further particular overlap integral value,

wherein said inner waveguide portion and outer waveguide portion are dimensioned and/or composed such that said inner waveguide portion overlap integral value and said outer waveguide portion overlap integral value have a predetermined ratio which provides optimal critical power coupling characteristics between said inner and outer waveguide portions.

4,943,136
OPTICAL BACKPLANE INTERCONNECTION

Alexander A. Popoff, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 9, 1988, Ser. No. 282,379
Int. Cl.[5] G02B 6/28
U.S. Cl. 350—96.16 **11 Claims**



1. An optical backplane arrangement comprising:

M circuit boards, each of said circuit boards having an optoelectronic bus transceiver, said optoelectronic bus transceiver having n optical signal lines;

M optical cables having N optical signal lines, one of said optical cables being connected to the optoelectronic bus transceiver of a specific one of said circuit boards so that each of the N optical signal lines of said optoelectronic bus transceiver is connected to a specific one of the N optical signal lines of said optical cable;

a reflective star coupler array having N reflective star couplers, each of said reflective star couplers having M guide channels, M input ports and a mixer, each of said guide channels being connected to said mixer and to a respective one of said input ports, said mixer having a reflective surface arranged so that light propagating along any one of said guide channels is reflected by said reflective surface and distributed by said mixer to all of said M guide channels, said reflective star couplers being configured and oriented relative to one another so that said input ports have a predetermined arrangement; and

an alignment matrix for connecting said optical cables to said reflective star coupler array, said alignment matrix having M×N alignment apertures, said alignment apertures being disposed in said predetermined arrangment so that each aperture holds a specific one of said N optical signal lines in alignment with a specific one of the input ports of said reflective star couplers.

4,943,137

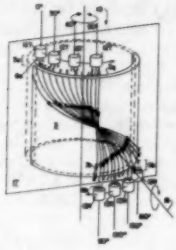
MULTI-CHANNEL, OFF-AXIS, BI-DIRECTIONAL FIBER OPTIC SLIPRING

J. Alexander Speer, Raleigh, N.C., assignor to KDI Electro-Tec Corporation, Blacksburg, Va.

Continuation-in-part of Ser. No. 7198, Jan. 27, 1987, abandoned. This application Oct. 3, 1988, Ser. No. 252,106

Int. Cl.[5] G02B *6/32*

U.S. Cl. 350—96.18 **6 Claims**



1. Fiber optic slipring with an intermediate optical component adapted to rotate at ½ the angular velocity of the slipring rotor, comprising:

a rotor including a plurality of light transmitting elements mounted in spaced relationship in confronting relationship to an entrance face of said intermediate optical component;

a stator including a corresponding plurality of light receiving elements mounted in corresponding spaced relationship in confronting relationship to an exit face of said intermediate optical component;

said intermediate optical component comprising an image conduit, image transporter, or coherent optical fiber bundle of monofibers or multifibers for receiving light from each of said light transmitting elements across a gap between said entrance face and said light transmitting elements and transmitting light from said image conduit, image transporter, or coherent optical fiber bundle of monofibers or multifibers across a second gap between said exit face and said plurality of light receiving elements;

a convergent/divergent lens mounted on each of said plurality of light transmitting and receiving elements to provide collimated light to a plurality of bi-directional channels formed by said image conduit, image transporter or coherent optical fiber bundle; and

said image conduit, image transporter, or coherent optical fiber bundle of monofibers or multifibers having at least the entrance and exit faces of the fibers thereof related by a two-fold rotation axis substantially perpendicular to a mirror plane, which relates the entrance and exit face positions of each half of said intermediate optical component, extending through the rotation axis of the slipring and said two-fold rotation axis and said mirror plane also intersecting at the rotation axis of said slipring.

4,943,138

COMBINATION OF OPTICAL CONNECTORS AND OPTICAL TERMINAL COVERS

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

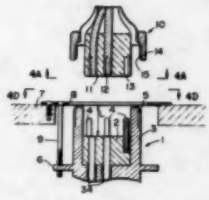
Filed May 22, 1989, Ser. No. 355,598

Claims priority, application Japan, Nov. 9, 1988, 63-283097

Int. Cl.[5] G02B *6/36*

U.S. Cl. 350—96.20 **19 Claims**

1. Connectors for connecting fiber optical cables comprising a first fiber optic cable having a light-emitting end portion which includes a plurality of first light guides each having a light-emitting end, a second fiber optic cable having a light-receiving end portion which includes a plurality of second light guides each having a light-receiving end, a first optical connector means and a second optical connector means, said first optical connector means comprising a first terminal holder having a front face, said first terminal holder having a plurality of spaced openings for receiving said first light guides such that said light-emitting ends are flush with said front face, said second optical connector means comprising a second terminal holder having a plurality of spaced openings for receiving said second light guides such that said light-receiving ends are flush with said front face of said second terminal holder, locating means on said first and second terminal holders for locating said first and second terminal holders in a coupling position in



which said light-emitting ends are aligned with respective light-receiving ends, said locating means comprising projection means on one of said first and second terminal holders and recess means in the other of said first and second terminal holders, said recess means receiving said projection means when said first and second terminal holders are in said coupling position, and connector ring means mounting each of said first and second terminal holders and operable to be detachably connected to thereby detachably retain said first and second terminal holders in said coupling position in which light rays are transmitted from said light-emitting ends of said first light guides to said aligned light-receiving ends of said second light guides.

4,943,139

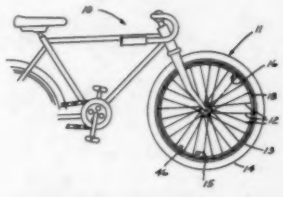
SPOKED WHEEL REFLECTOR EMPLOYING ENCAPSULATED RETROREFLECTIVE TUBING

Chester A. Bacon, Jr., and James C. Coderre, both of Saint Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 19, 1988, Ser. No. 246,217

Int. Cl.[5] G02B *5/128*; B60B *7/00*

U.S. Cl. 350—105 **12 Claims**



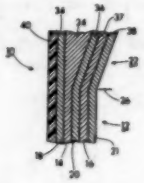
1. A retroreflective tubing, comprising a core material, a retroreflective material comprising glass microspheres attached to an outer surface of the core material, and an encapsulating material providing an airspace between outer surfaces of the microspheres and the inner surface of the encapsulating material; the tubing being sufficiently flexible to be intertwined among spokes of a wheel and to assume a portion of the circular shape of the wheel.

4,943,140

OPTICAL ELEMENT FOR A VEHICLE WINDSHIELD

Floyd E. Woodard, and Zane V. Zeable, both of Olivette, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jul. 27, 1989, Ser. No. 385,350
Int. Cl.[5] G02B *5/28*
U.S. Cl. 350—164 **12 Claims**



1. An optical element for a motor vehicle windshield comprising, in combination:

(a) an interference filter which includes one or more light-reflecting metal layers and one or more reflection-suppressing layers for coacting with the one or more metal layers to minimize reflection and enhance transmission in the visible region;

(b) a gradient band continuation of said interference filter above the direct line of vision through a windshield when disposed in a motor vehicle, for reflective rejection of solar energy, said band including a light-reflecting metal layer gradually increasing in thickness toward a lateral edge of said band;

(c) an anti-glare backing behind said gradient band for suppressing luminous reflection from within said motor vehicle when said optical element is disposed in said windshield.

4,943,141

SOLAR RAY COLLECTING DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 325,701
Claims priority, application Japan, May 17, 1988, 63-120389
Int. Cl.[5] G02B *7/2*; F24J *2/08*; F21S *11/00*
U.S. Cl. 350—258 **2 Claims**

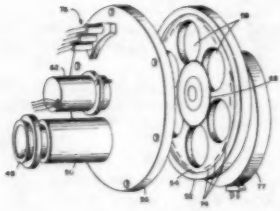
1. A solar ray collecting device comprising a solar ray collecting means comprising a plurality of solar ray collecting elements, each of said elements consisting of a lens for focusing solar rays and an optic fiber cable having a light-receiving end located at the focal point of said lens, a transparent dome for covering said solar ray collecting means, a base plate for supporting said dome, a first-revolution shaft for rotating said base plate, a support arm for supporting said first-revolution shaft and a second-revolution shaft for rotating said support arm around an axis which is perpendicular to the axis of the first-revolution shaft, wherein the first-revolution shaft and the second-revolution shaft are controlled in such a way as to direct the light-receiving surface of said lens toward the sun to introduce solar rays into the optic fiber cable in order to transmit said solar rays therethrough to any place where the light is needed, characterized in that each of said solar ray collecting elements is provided with a correct mounting means for setting said light-receiving surface of said lens at a right angle to the light that has passed through said dome.

4,943,142

IMAGING MICROSPECTROFLUORIMETER

Fredric S. Fay, Worcester; Kevin E. Fogarty, Worcester, and Cyril Rodgers, Paxton, all of Mass., assignors to University of Massachusetts Medical Center, Worcester, Mass.

Continuation of Ser. No. 204,931, May 31, 1988, Pat. No. 4,859,063, which is a continuation of Ser. No. 34,777, Apr. 3, 1987, abandoned, which is a continuation-in-part of Ser. No. 900,407, Aug. 26, 1986, Pat. No. 4,744,667, which is a continuation-in-part of Ser. No. 828,766, Feb. 11, 1986, abandoned. This application Jun. 13, 1989, Ser. No. 365,320
Int. Cl.[5] G02B *5/20*
U.S. Cl. 350—315 **12 Claims**



1. A filter accessory comprising:

an optical conduit between a light inlet and a light outlet;

an inlet connector at the inlet end of the optical conduit for coupling the conduit into a microscope system;

an outlet connector complementary to the inlet connector at the outlet end of the optical conduit for coupling the conduit into a microscope system;

a filter assembly eccentrically mounted relative to the optical conduit, the assembly including a filter housing and a filter disc within the filter housing, the filter disc having a plurality of removable filter elements circumferentially spaced about a filter axis offset from the optical conduit;

a filter drive for rotating the filter disc about the filter axis; and

means for sensing the position of the filter disc as each filter element is positioned between the light inlet and light outlet, the position being identified by optically coded marks on the filter disc which are associated with each filter element and which are radially displaced relative to each other for each filter element.

4,943,143

DISPLAY PANEL

Seisuke Yamashita, Matsumoto, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed May 11, 1988, Ser. No. 192,540
Claims priority, application Japan, May 13, 1987, 61-116605
Int. Cl.[5] G02F *1/13*
U.S. Cl. 350—339 R **26 Claims**

1. A display panel comprising a substrate having a plurality of display elements disposed thereon, each display element comprising:

(a) a pixel electrode disposed on the substrate;

(b) a scan electrode disposed on the substrate separate from the pixel electrode;

(c) two display drive elements, one disposed over a first part

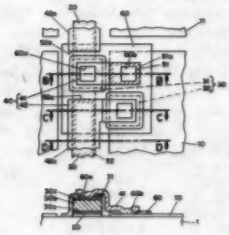
of the pixel electrode and the other disposed over a first part of the scan electrode;

(d) an insulating layer extending over the two display drive elements and over at least a second part of the pixel electrode and having at least three openings formed therein, two of the openings being coincident with and exposing a portion of each of the display drive elements and a third opening being disposed so as to expose a portion of the second part of the pixel electrode;

(e) a first connecting layer disposed over the insulating layer, said first connecting layer formed by etching, and said first connecting layer forming an electrical connection through the openings in the insulating layer between the exposed portion of the display drive element disposed over the scan electrode and the exposed portion of the pixel electrode; and

(f) a second connecting layer disposed over the insulating layer, said second connecting layer formed by etching, and said second connecting layer forming an electrical connection between the portion of the display drive element disposed over the pixel electrode exposed through the opening in the insulating layer and an exposed part of the scan electrode.

14. A method for producing a display panel comprising a substrate having a plurality of display elements disposed thereon, comprising the steps of:



(a) forming a pixel electrode on the substrate;

(b) forming a scan electrode on the substrate separate from the pixel electrode;

(c) forming two display drive elements, one disposed over a first part of the pixel electrode and the other disposed over a first part of the scan electrode;

(d) forming an insulating layer which extends over the two display drive elements and over at least a second part of the pixel electrode and having at least three openings formed therein, two of the openings being coincident with and exposing a portion of each of the display drive elements and a third opening being disposed so as to expose a portion of the second part of the pixel electrode;

(e) forming a first connecting layer over the insulating layer by etching, such that said first connecting layer forms an electrical connection through the openings in the insulating layer between the exposed portion of the display drive element disposed over the scan electrode and the exposed portion of the pixel electrode; and

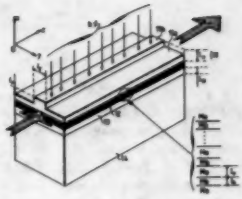
(f) forming a second connecting layer over the insulating layer by etching, such that said second connecting layer forms an electrical connection between the portion of the display drive element disposed over the pixel electrode exposed through the opening in the insulating layer and an exposed part of the scan electrode.

4,943,144

ELECTROMAGNETIC WAVE MODULATOR WITH QUANTUM WELL STRUCTURE AND ITS USE AS A POLARIZER

Dominique Delacourt, Paris; Michel Papuchon, Massy, and Jean Paul Pocholle, Arpajon, all of France, assignors to Thomson-CSF, Paris, France

Filed Aug. 30, 1988, Ser. No. 238,250
Claims priority, application France, Sep. 1, 1987, 87 12153
Int. Cl.[5] G02F *1/01*
U.S. Cl. 350—354 **5 Claims**



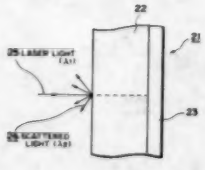
1. A modulator for electromagnetic waves to modulate a wave with a frequency ν_1, called a wave to be modulated, by a signal modulating the amplitude of a second wave with a frequency ν_2, called a control wave, said modulator comprising at least one first layer of semiconducting material of a first type, included between two layers of a semiconducting material of a second type, all the layers being crossed by the wave to be modulated and by the control wave; the two types of materials being such that there is a potential well in the conduction band and in the valence band of each first layer; the thickness of each first layer being such that the electrons of its conduction band possess at least two permitted, discrete energy levels, the energy difference between these two levels corresponding to a frequency close to the frequency ν_1 of the wave to be modulated and said thickness of each first layer being such that the holes of its valence band possess permitted energy levels such that the energy difference between the permitted fundamental level for the holes in the valence band and the permitted fundamental level for the electrons in the conduction band has a value close to that corresponding to the frequency of the control wave.

4,943,145

DISPLAY METHOD AND APPARATUS

Seizo Miyata, 3-18-26 Shimohoya, Hoya-shi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha and Seizo Miyata, both of Tokyo, Japan

Filed Jul. 12, 1988, Ser. No. 217,650
Claims priority, application Japan, Jul. 13, 1987, 175200
Int. Cl.[5] G02F *1/01*; H03F *7/00*; H04N *3/02*
U.S. Cl. 350—354 **25 Claims**

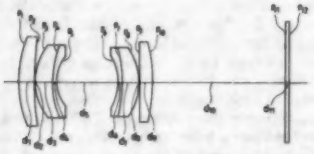


1. A display method, comprising the steps of:

providing a display medium having a display area capable of converting coherent light into light of a shorter wavelength through a nonlinear optical effect and converting the coherent light into scattered light, and

illuminating imagewise the display area with coherent light to form a display image with scattered light having a wavelength different from that of the coherent light at the illuminated part of the display area.

4,943,146
READING LENS SYSTEM
Takashi Iizuka, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 10, 1989, Ser. No. 420,497
Claims priority, application Japan, Oct. 12, 1988, 63-133113[U]; Sep. 14, 1989, 1-238741
Int. Cl.[5] G02B 9/38
U.S. Cl. 350—471 **5 Claims**



1. A reading lens system comprising, in order from the object side, a positive meniscus first lens element having a convex surface directed toward the object, a positive meniscus second lens element having a convex surface directed toward the object, a negative meniscus third lens element having a convex surface directed toward the object, a negative meniscus fourth lens element having a concave surface directed toward the object, a positive meniscus fifth lens element having a concave surface directed toward the object, and a positive sixth lens element, said second and third lens elements being cemented and said fourth and fifth lens elements being also cemented to provide an overall system of a four-unit-six-element composition, the improvement wherein said lens system satisfies the following conditions:

(1) $0.28 < d_5 0.35$

$$0.28 < d_3 < 0.35 \quad (1)$$

$$1.10 < \frac{r_5 + |r_6|}{d_5} < 1.80 \quad (2)$$

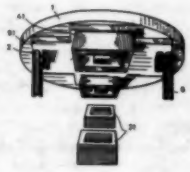
$$0.80 < \frac{r_3 + |r_3|}{d_3 + d_4 + d_5 + d_6} < 1.40 \quad (3)$$

$$0.70 < \frac{r_3 + r_5}{r_4} < 1.50 \quad (4)$$

$$0.80 < \frac{|r_6| + |r_3|}{|r_7|} < 1.30 \quad (5)$$

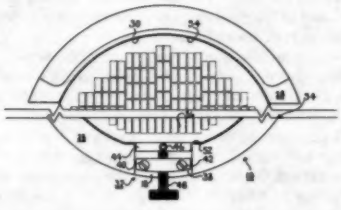
where r_i is the radius of curvature of the ith surface, and d_i is the distance between the ith and the (i+1)th surfaces and f is the overall focal length of the system when f takes a value of 1 (one).

4,943,147
CHOPPING SECONDARY MIRROR SYSTEM
Shigeki Mizuno; Takaharu Ueda; Tetsu Yamamoto, and Takashi Yumura, all of c/o Mitsubishi Denki Kabushiki Kaisha Oyokiki Kenkyusho, 1-1 Tsukaguchi Honmachi 8-chome, Amagasaki-shi, Japan
Filed Aug. 8, 1989, Ser. No. 390,900
Claims priority, application Japan, Aug. 20, 1988, 63-206823
Int. Cl.[5] G02B 26/08
U.S. Cl. 350—486 **15 Claims**



1. A chopping secondary mirror system, comprising:
a secondary mirror;
driving motor means comprising magnetic circuits and coils, for causing said secondary mirror to chop about a rotation axis thereof;
driving motor mounting means for mounting said driving motor on said secondary mirror;
means for supporting said secondary mirror for rotation about said rotation axis;
said driving motor mounting means including a raised center portion on a side thereof facing said secondary mirror; and
said raised portion of said driving motor mounting means is secured to said secondary mirror at a center portion of said secondary mirror, whereby heat from said driving motor is substantially blocked from reaching said secondary mirror.

4,943,148
SILICON WAFER HOLDER
Carl W. Mondragon, and David A. Sperry, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Filed Oct. 20, 1988, Ser. No. 260,468
Int. Cl.[5] G02B 21/34
U.S. Cl. 350—529 **15 Claims**



1. A holder for microscopically observing a generally circular, planar wafer, comprising:
(a) a substantially circular platen having a planar surface adapted to receive said wafer and having a diameter greater than a diameter of said wafer;
(b) a circumferential rib extending around at least a portion of a periphery of said platen, said rib being raised above the planar surface of said platen;
(c) a radially aligned slot provided in the planar surface of

said platen and diametrically opposed to said circumferential rib; and

(d) a bracket abutting against a major flat of the wafer and sliding radially within the radially aligned slot, such that a circumferential arc of the wafer is in substantially uniform contact with the circumferential rib.

4,943,149

TELESCOPE

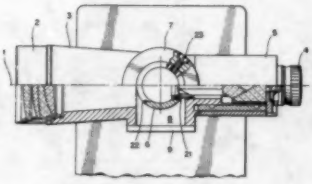
Erika Wahlen, Erlinsbach, Switzerland, and Dieter Hoffmann, Buchs, Fed. Rep. of Germany, assignors to Kern & Co. Ltd., Aarau, Switzerland

Filed Sep. 7, 1988, Ser. No. 241,249

Claims priority, application Switzerland, Sep. 8, 1987, 3451/87

Int. Cl.[5] G02B *23/16*

U.S. Cl. 350—568 **5 Claims**



1. A telescope comprising:

a telescope assembly having an object-side barrel with an objective lens and an eye-side barrel with an eyepiece each having an optical axis;

a bearing bush fixed between the object-side barrel and the eye-side barrel having its axis arranged substantially perpendicular to said optical axis to provide a tilting axis for said telescope, said bush having a first opening along its axis and directed sideways from the optical axes and having second and third apertures along the optical axes to pass the optical path of the telescope; and

an axle fitting into said first opening of said bearing bush in coaxial relation to said tilting axis.

4,943,150

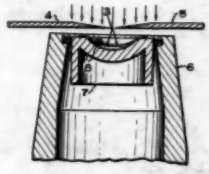
METHOD OF MAKING VARIABLE MODULUS LENSES

William G. Deichert, Macedon, and Richard J. Wrue, Rochester, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Mar. 22, 1988, Ser. No. 171,585

Int. Cl.[5] G02C *7/04*; B29D *11/00*

U.S. Cl. 351—177 **5 Claims**



1. A method for forming a contact lens comprising:

subjecting a soft contact lens impregnated with a polymerizable liquid composition which may be polymerized in said lens to render said lens relatively rigid and which may be polymerized upon exposure to radiation with radiation in a selected manner so as to render selected portions of said lens relatively rigid.

4,943,151

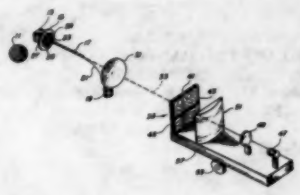
SCHEINER-PRINCIPLE VERNIER OPTOMETER

William B. Cushman, Pensacola, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 23, 1989, Ser. No. 370,521

Int. Cl.[5] A61B *3/10, 3/02*

U.S. Cl. 351—203 **20 Claims**



1. An optometer apparatus comprising:

a pinhole aperture plate having first and second horizontally positioned apertures disposed on opposite sides of a first optical axis;

first and second orthogonally oriented polarizing filters respectively covering said first and second horizontally positioned apertures;

a positive lens having an optical axis on said first optical axis and being positioned at a distance of approximately one focal length from said pinhole plate;

a slit aperture plate having a vertical slit;

third and fourth vertically positioned polarizing filters selectively disposed adjacent to said slit aperture plate to divide said slit vertically, said third and fourth polarizing filters being respectively oriented parallel to said first and second polarizing filters;

a cylinder lens; and

a monochromatic light source for emitting light at a first wavelength;

said slit aperture, said third and fourth polarizing filters, said cylinder lens and said monochromatic light source being fixedly positioned relative to one another by translatable along the optical axis of said positive lens.

4,943,152

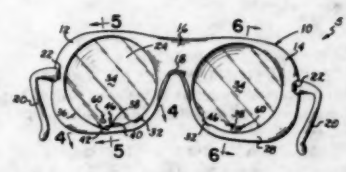
MANUALLY VARIABLE LIGHT FILTERING SUNGLASSES

Richard J. Whelen, 1103 Bandanna Dr., Cincinnati, Ohio 45238

Continuation-in-part of Ser. No. 99,107, Sep. 21, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 277,712

Int. Cl.[5] G02C *7/12*

U.S. Cl. 351—49 **30 Claims**



1. An eyeglass frame for readily mounting and demounting a rotatable lens comprising:

at least one rim portion having exterior sidewalls defining a front and back to the eyeglass frame, the rim portion

having a lens-receiving hole situated between the front and back of the frame;

a groove formed about the lens-receiving hole and in the rim portion between the sidewalls;

an access channel in the rim portion extending between and to the groove and one of the sidewalls to define a thread plane for threadably receiving a rotatable lens into and out of the groove whereby the lens may be readily mounted to and demounted from the eyeglass frame by rotation thereof.

4,943,153

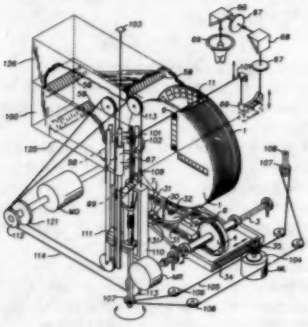
GUIDE MEANS FOR RANDOM ACCESS RETRIEVAL APPARATUS

John C. Nelson, 117 W. Park, Providence, R.I. 02908

Filed Sep. 9, 1988, Ser. No. 242,281

Int. Cl.[5] G03B *33/06*

U.S. Cl. 353—25 **17 Claims**



1. In an apparatus for random access retrieval of micrographic and data images stored along the radii of stacked windowed discs, a disc selection system and an optical system, said systems comprised of elements and including a first power means for moving elements of said disc selection system linearly and elements of said optical system rotationally, a second power means for moving elements of said disc selection system angularly and rotationally and a third power means for moving said optical system linearly and a plurality of bearing and guide means which transmit rotary and linear motion, each bearing and guide means comprised of a shaft transmitting rotary motion and means permitting linear sliding movement along said shaft, a carrying structure for said optical system slideably mounted on said shaft, means mounted on said carrying structure for rotation with said shaft, supporting structure for elements of said disc selection system slideable along an associated shaft to position the disc selection means adjacent a selected disc and a means rotatable with said shaft rotating the selected disc into a position whereby the optical system may scan the selected image.

4,943,154

PROJECTION DISPLAY APPARATUS

Yoshito Miyatake, and Yoshihiro Masumoto, both of Neyagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1989, Ser. No. 314,071

Claims priority, application Japan, Feb. 25, 1988, 63-42665; Mar. 8, 1988, 63-54234; Mar. 24, 1988, 63-70035; Mar. 24, 1988, 63-70036

Int. Cl.[5] G03B *21/00*

U.S. Cl. 353—31 **67 Claims**

1. A projection display apparatus comprising:

a light source for generating a light containing three primary color lights;

component color separating means for separating the light from the light source into the three primary color lights;

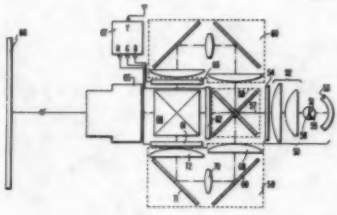
three light valves having formed therein optical images for respectively modulating the three primary color lights from the component color separating means;

driving means for driving the three light valves according to a video signal to form the optical images;

light combining means for combining modulated lights from the three light valves into a composite luminous flux;

projection means for projecting the composite luminous flux onto a screen upon to produce thereon an enlargement of the optical images; and

light transmitting means disposed on an optical path where a distance from the component color separator means to a corresponding light valve is at least two times a width of



an effective light flux incident on the corresponding light valve for directing a light from the component color separator means to the corresponding light valve,

wherein said light transmitting means comprises:

an input side convergent lens disposed at an input end;

an output side convergent lens disposed at an output end; and

a central convergent lens disposed on an optical path between the input side and output side convergent lenses so that a real image of a luminous element in the light source is formed by the input side convergent lens at a position adjacent to the central convergent lens while a real image of an object positioned about the input side convergent lens is formed by the central convergent lens at a location adjacent to the output side convergent lens, said output side convergent lens permitting its output light to reach the projecting means.

4,943,155

COLOR PROJECTION SYSTEM WITH A COLOR CORRECTION WEDGE

Eugene W. Cross, Jr., Escondido, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 137,486, Dec. 22, 1987, Pat. No. 4,890,901.

This application Oct. 11, 1989, Ser. No. 419,985

Int. Cl.[5] G03B *21/00*; G02B *5/04*; G02F *1/13*

U.S. Cl. 353—33 **3 Claims**

1. A color projection system comprising:

a light source,

a projection lens,

a liquid crystal light valve,

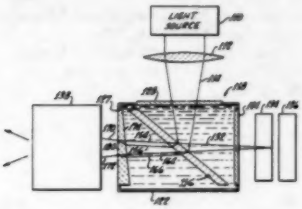
an image generator for modulating light transmitted to said liquid crystal light valve,

polarizing beamsplitter means interposed between said light source and said liquid crystal light valve and between said light valve and said projection lens for reflecting light from said light source to said liquid crystal light valve and for transmitting light reflected from said valve to said projection lens,

said polarizing beamsplitter means having an optical axis and comprising

a prism body of a fluid having a first index of refraction at a selected wavelength,

a parallel sided transparent plate suspended within said fluid for reflecting light from said light source to said light valve and for transmitting light from said light valve to said projection lens, said plate being formed of a solid material having a second index of refraction substantially equal to said first index of refraction at said selected wavelength, whereby light transmitted



through said plate is subject to a complex lateral chromatic aberration that increases with increasing distance from the optical axis, and

a color correction wedge interposed between said plate and said projection lens in contact with said fluid for correcting light transmitted through said plate for said lateral chromatic aberration, said wedge being formed of a material having the same index of refraction as said plate over a band of wavelengths.

4,943,156

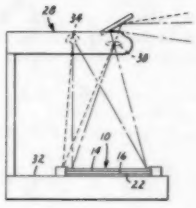
OFF AXIS FRESNEL REFLECTOR FOR LIQUID CRYSTAL DISPLAY

Dennis F. Vanderwetf, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 12, 1988, Ser. No. 243,588

Int. Cl.[5] G03B *21/00*

U.S. Cl. 353—66 **4 Claims**



1. A liquid crystal display assembly for use with a reflective type overhead projector comprising:

a liquid crystal display including two transparent glass plates between which is disposed a liquid crystal imaging material;

a first-surface, variable groove with Fresnel reflector portion disposed adjacent one of said liquid crystal glass plates wherein said Fresnel reflector portion is a first-surface reflector portion in that said Fresnel reflector portion includes a reflective surface immediately adjacent said liquid crystal display, wherein said Fresnel reflector portion is a variable groove width Fresnel reflector portion in that the grooves of said reflective surface progressively decrease outwardly from the center of said Fresnel reflector portion, said first-surface reflective surface and said variable groove width combining to minimize the distance between said reflective surface and said liquid crystal imaging material to minimize double imaging of an image projected by said overhead projector and wherein said Fresnel reflector portion is off-axis in that the center of said reflector is not included in said Fresnel reflector portion so that a spurious bright spot coinciding in the projected image with the center of said Fresnel reflector is eliminated.

4,943,157

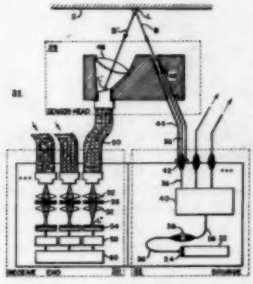
FIBER OPTIC TRIANGULATION GAGE

Bruce W. Reding, Elmira, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed May 18, 1989, Ser. No. 353,500

Int. Cl.[5] G01C *3/00, 5/00*

U.S. Cl. 356—1 **21 Claims**



1. A triangulation sensor comprising:

a source of light;

first fiber optic means, coupled to said source, for projecting a beam of said light toward an object surface to form a light spot on said surface;

a coherent bundle of optical fibers having an input face and an output face, disposed in operative relationship with said first fiber optic means and said object for receiving an image of said light spot from said object;

lens means for imaging said light spot onto said input face of said coherent bundle;

position detecting means comprising a detector array optically coupled to said coherent bundle at said output face, said array producing a plurality of signals indicative of the distance from the sensor to said object; and

means coupled to receive said signals from said array for determining said distance from said sensor and operatively associated with said coherent bundle for ranging said object proximate to said light spot by means of the position of said image on said position detecting means.

4,943,158

SENSOR CONTROLLED LEVELING DEVICE

Peter Pertl, Tulpenstr. 3, D-8200 Rosenheim, and Uwe Knauss, Prien, both of Fed. Rep. of Germany, assignors to Peter Pertl, Rosenheim, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,525

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639770

Int. Cl.[5] G01C *3/08;* G01B *11/26;* E02F *3/76*

U.S. Cl. 356—4 **16 Claims**

1. A sensor controlled leveling device comprising:

a laser sensor for detecting deviation of a datum plane defined by said sensor in relation to a reference plane swept by a laser beam;

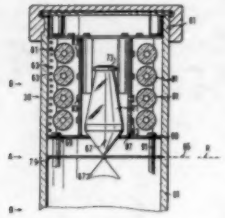
processing electronic circuitry;

a servo drive adapted to respond to said circuitry and connected with said laser sensor to correct for any deviation of the attitude of the datum plane of the laser sensor rela-

tive to the reference plane to return the datum plane of the laser sensor toward the reference plane;

said laser sensor including two solid, conical or polygonal tapered light guides converging towards each other with each guide having a tip and a base, said tips lying in opposition to and directly adjacent one another and on opposite sides of the datum plane;

photodetectors disposed adjacent said light guide bases



remote from the tips thereof for receiving light from said light guides and providing output signals of different magnitude in response thereto; and

a comparator forming part of said processing circuitry for operating said drive in response to said output signals to locate said sensor such that the datum plane and reference plane are substantially coincident and the reference plane lies substantially centrally located between the two converging tips of the tapering light guides.

4,943,159

METHOD AND APPARATUS FOR GUIDING AND COLLECTING LIGHT IN PHOTOMETRY OR THE LIKE

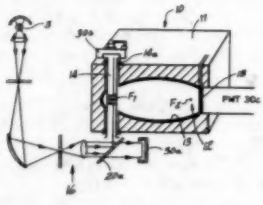
Hans Oetliker, Muri; Peter Winiger, Wohlen, and Sonja Stempfel, Zurich, all of Switzerland, assignors to Inotech AG, Wohlen, Switzerland

Continuation-in-part of Ser. No. 919,257, Oct. 15, 1986, which is a continuation of Ser. No. 731,868, May 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 684,482, Dec. 21, 1984, abandoned. This application Feb. 26, 1988, Ser. No. 160,534

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3347080

Int. Cl.[5] G01N *21/49, 21/64, 21/59*

U.S. Cl. 356—73 **19 Claims**



1. A method for guiding and collecting light which issues from a light source and which is passed as an incident primary modulated or unmodulated beam to a specimen or like material to be measured comprising:

providing a measuring chamber defined by a first reflector body having a reflective surface of a desired shape and a longitudinal axis which defines a first axis of symmetry;

positioning a compartment containing said specimen within said chamber so that said specimen is disposed substantially at a first focus of the reflector body;

passing a primary light beam from said source through said compartment without said beam being reflected off said reflector body to generate at least two measuring beams; and

conducting said beams to at least one detector oriented at about 90° with respect to said axis with at least one of said beams being reflected at said reflective surface.

4,943,160

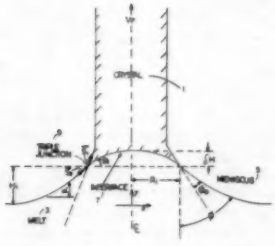
INTERFACE ANGLE ESTIMATION SYSTEM

Michael A. Gevelber, Newtonville, and Anthony T. Patera, Watertown, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 25, 1988, Ser. No. 224,490

Int. Cl.[5] G01B *11/00*

U.S. Cl. 356—372 **18 Claims**



1. An interface angle estimation system comprising: thermal and surface imagers and means for determining an interface angle θ_i at an interface triple junction of a crystal growing from a melt material wherein the thermal imager provides temperature gradient data surface orientation data from the crystal and from a meniscus around the triple junction to the means and wherein the means determines the interface angle.

4,943,161

METHOD AND APPARATUS FOR THE DETECTION OF HYDROCARBONS DISSOLVED IN BODIES OF WATER

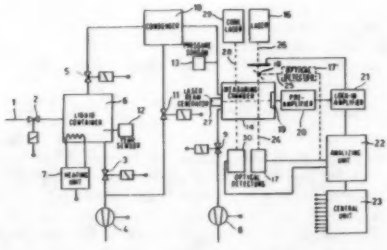
Walfried Michaelis, Seevetal, and Claus Weitkamp, Wentorf, both of Fed. Rep. of Germany, assignors to Gkss Forschungszentrum Geesthacht GmbH, Geesthacht, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 573,876, Jan. 25, 1984, abandoned. This application Nov. 29, 1988, Ser. No. 277,183

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, 3302656

Int. Cl.[5] G01N *21/00*

U.S. Cl. 356—437 **9 Claims**



1. A method for the detection and the measurement of hydrocarbons dissolved in bodies of water, comprising the steps of: introducing a water sample, without a loss of hydrocarbons

therefrom, into a sealed measuring system, driving any hydrocarbons out of solution in the water sample into a gaseous phase, directing a first laser beam of a wavelength selected so as to provide for at least partial overlapping with the absorption lines of said hydrocarbons through said gaseous phase for absorption therein by hydrocarbons, directing a correction laser beam of a wavelength at which such correction beam is not subject to absorption by the hydrocarbons through said gaseous phase so as to determine the contribution of gases other than hydrocarbons to the absorption of said first laser beam, determining the absorption of said first laser beam by said hydrocarbons, calculating the partial pressure of said hydrocarbons in said gaseous phase from the absorption of said first laser beam in said gaseous phase by the hydrocarbons, and determining the concentration of the hydrocarbons in the water sample from the partial pressure of the hydrocarbons in the gaseous phase on the basis of the distribution equilibrium of the hydrocarbons utilizing the given temperature and pressure conditions.

4,943,162

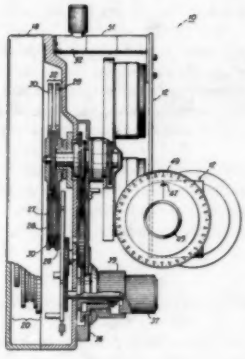
ASTIGMATIC SELF-REFRACTOR AND METHOD OF USE

Clinton N. Sims, 3949 Evans Ave., Fort Myers, Fla. 33901

Continuation-in-part of Ser. No. 116,322, Nov. 2, 1987, Pat. No. 4,840,479, which is a continuation-in-part of Ser. No. 23,980, Mar. 16, 1987, Pat. No. 4,820,040, which is a continuation of Ser. No. 670,398, Nov. 9, 1984, abandoned. This application Feb. 13, 1989, Ser. No. 310,334

Int. Cl.[5] A61B *3/02*

U.S. Cl. 351—235 **21 Claims**



1. A refractor comprising at least one variable crossed cylinder lens assembly comprising:

a. a sphere lens;

b. a first pair of identical cylinder lenses, each of which cylinder lens is of power equal to one-half the power of the sphere lens and of opposite sign, mounted in a means for rotating each cylinder lens in the direction opposite the other at the same rate relative to a first combined lens axis; and

c. a second pair of identical cylinder lenses, each of which cylinder lens is of power equal to one-half the power of the sphere lens and of opposite sign, mounted in a means for rotating each cylinder lens in the direction opposite the other at the same rate relative to a second combined lens axis, which axis is offset 45 degrees from the first combined lens axis.

4,943,163

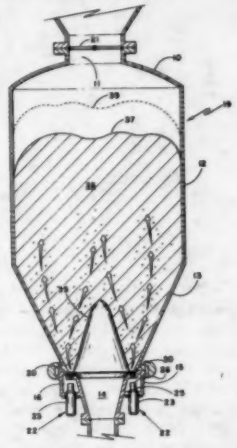
BLENDER FOR PNEUMATICALLY MIXING BATCHES OF DRY GRANULAR MATERIALS BY TUMBLING

James R. Steele, Stillwater, Minn., assignor to Dynamic Air Inc., St. Paul, Minn.

Filed Sep. 22, 1989, Ser. No. 411,107

Int. Cl.[5] B01F *13/02*

U.S. Cl. 366—106 **4 Claims**



1. In an air blender for pneumatically mixing together dry granular materials comprising a vertically oriented elongated container having an input opening at the top for inputting granular materials to be mixed, cylindrical side walls, a normally closed central discharge opening at the bottom, lower walls sloped inwardly from the bottom of the cylindrical walls to said discharge opening, and an air manifold surrounding said discharge opening having an inner air chamber containing pressurized air, the improvement comprising:

a series of air nozzles in the manifold equally spaced around the discharge opening for providing air communication between the inner air chamber of the manifold and the interior of the container, said nozzles oriented at an angle to direct the pressurized air generally parallel to the longitudinal axis of the container;

means for repeatedly opening and closing said nozzles;

a source of pressurized air;

conduit means for delivering pressurized air from said source of pressurized air to the inner chamber of the manifold; and

adjustable throttling valve means located in said conduit for controlling the air flow into the manifold inner chamber from said pressurized air source when said nozzles are opened.

4,943,164

MIXING APPARATUS FOR MIXING REAGENT FOR USE IN AUTOMATIC CHEMISTRY ANALYZER

Tadashi Ohishi, and Hiroshi Umetsu, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 10, 1989, Ser. No. 391,997

Claims priority, application Japan, Aug. 26, 1988, 63-210746

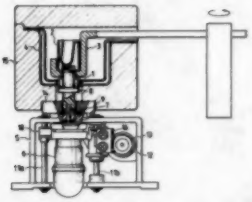
Int. Cl.[5] B01F *11/00, 15/06*

U.S. Cl. 366—149 **15 Claims**

1. A mixing apparatus for mixing a reagent for use in an automatic chemistry analyzer comprising a reagent refrigerator, a reagent table extending into said reagent refrigerator, a reagent vessel installed on said reagent table and received in said reagent refrigerator, and a mixing apparatus for mixing a solution in said reagent vessel in accordance with movement of said reagent vessel, said mixing apparatus having a rotor dis-

posed in said reagent refrigerator and a rotor driving apparatus for rotating said rotor, wherein:

said reagent vessel is installed on said reagent table, said rotor is disposed in said reagent refrigerator and is moved in an up-and-down direction by moving means, said reagent vessel has a first engagement member at a bottom face of said reagent vessel, said rotor has a second engagement member at a top face of said rotor, said second engagement member of said rotor is engaged with or



disengaged from said first engagement member of said reagent vessel, said rotor driving apparatus is installed outside said reagent refrigerator, a first sealing member for sealing cold air in said reagent refrigerator is fixed on a rotating shaft of said rotor at a lower face of said reagent refrigerator, and a second sealing member for preventing water droplets from falling down from said reagent refrigerator outside of said mixing apparatus is fixed on said rotating shaft of said rotor at a bottom portion of said reagent refrigerator.

4,943,165

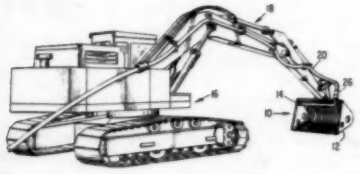
SLUDGE STABILIZING METHOD AND APPARATUS

Bruce E. Boggs, Roswell, Ga., assignor to United States Pollution Control Company, Inc., Oklahoma City, Okla.

Filed Jun. 16, 1989, Ser. No. 366,993

Int. Cl.[5] B01F *15/00, 5/06*

U.S. Cl. 366—348 **54 Claims**



1. An apparatus for injecting and mixing a material into a liquid-containing sludge in a lagoon or the like, such apparatus comprising:

a bucket adapted to be attached to the articulated arm of a backhoe or like equipment, said bucket having a scoop opening, spaced sides and a generally C-shaped body portion extending between the sides of said bucket the body portion having a plurality of generally C-shaped tines spaced laterally along the width thereof between said sides providing slots therebetween so that sludge may pass through said bucket after entering through said scoop opening or said slots; and

manifold means extending across the interior of said bucket between the sides thereof and having apertures therein for dispensing material into said bucket so that as sludge passes therethrough the dispensed material will be injected into the sludge.

4,943,166

DEVICE FOR DETECTING THE POSITION OF AN OPTICAL HEAD

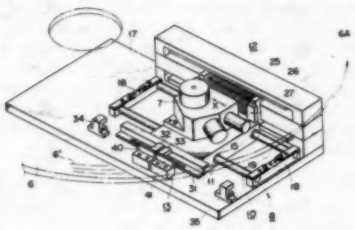
Hiroshi Yamashita, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 26, 1988, Ser. No. 148,694

Claims priority, application Japan, Jan. 27, 1987, 62-15136; Jan. 27, 1987, 62-15138

Int. Cl.[5] G11B *7/18*

U.S. Cl. 369—32 **11 Claims**



1. A position-detecting device for detecting a position of an optical head, the optical head having an optical axis and being mounted on a carrier movable in a predetermined direction perpendicular to the optical axis, comprising:

a fixed base;

a slit member movable with the carrier between a first position and a second position, the slit member having a first end and a second end opposite said first end and having a plurality of slits which are arranged in the predetermined direction;

emitting means, fixed on the base between the first and second positions, for emitting first and second light beams for illuminating the slit member;

first detecting means, fixed on the base, for detecting the first and second light beams passing through the slits of said slit member, to respectively generate first and second signals in accordance with the movement of said slit member, the first and second signals having a phase different of $\pi/2$; and

second detecting means, fixed on the base, for detecting the first end of the slit member when the slit member is in the first position, and for detecting the second end of the slit member when the slit member is in the second position.

4,943,167

PLASTIC BAG AND METHOD AND APPARATUS OF MANUFACTURE

Edward Gelbard, Monte Carlo, Monaco, assignor to Hilex Poly Company, Inc., Los Angeles, Calif.

Division of Ser. No. 801,752, Nov. 26, 1985. This application Jun. 12, 1987, Ser. No. 38,234

Int. Cl.[5] B65D *33/06*

U.S. Cl. 383—8 **1 Claim**

1. A plastic bag comprising:

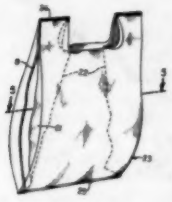
a tube of thermoplastic film, having at least one longitudinal slit seal extending the length of the tube;

a pair of opposing gussets provided in said tube, each gusset having a central fold, said gussets oriented about said tube such that said longitudinal slit seal is not positioned at the central fold or external fold of either gusset;

transverse heat seals provided at the top and bottom of said bag, said bottom and top transverse heat seals intersecting said longitudinal slit seal; and

two opposing bag handles defined by cutting an opening in said bag at said top transverse heat seal, each handle including an uncut portion of said top transverse heat seal,

and at least one handle including said longitudinal slit seal extending from said transverse bottom heat seal to the



uncut portion of said top transverse heat seal in said handle.

4,943,168

PACKAGE BAND

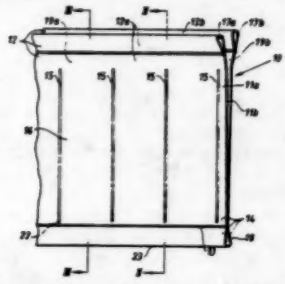
Sven-Olof Berg, Haverdal, and Ingemar Broden, Halmstad, both of Sweden, assignors to Pronova AB, Halmstad, Sweden

Filed Jul. 12, 1988, Ser. No. 217,635

Claims priority, application Sweden, Jul. 13, 1987, 8702838

Int. Cl.[5] B65D *30/22*

U.S. Cl. 383—38 **5 Claims**



1. A package band comprising two walls of flexible material in adjoining relation, said walls having first and second edge regions extending longitudinally of the band, first connecting means joining said walls together at said second edge region to provide a longitudinal joint thereat, means providing a succession of transverse joints spaced longitudinally of the band at which the walls are joined together to form with said longitudinal joint a succession of storage pockets longitudinally of the band, said walls at said first edge region being disconnected to permit access to said storage pockets for goods to be inserted into and removed from said pockets, and second connecting means at said second edge region for forming a continuous opening extending longitudinally of the band externally of said longitudinal joint and said pockets, said walls each including at said first edge region a connection forming a tunnel extending longitudinally of the band.

4,943,169

THIN TYPE LINEAR MOTION ROLLING GUIDE UNIT WITH APPARATUS FOR PREVENTING DEVIATION OF HOLDER

Naomi Kasai, Tokyo, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1990, Ser. No. 480,798

Claims priority, application Japan, Aug. 14, 1989, 1-94355[U]

Int. Cl.[5] F16C *29/06*

U.S. Cl. 384—43 **12 Claims**

1. A thin type linear motion rolling guide unit with an apparatus for preventing a deviation of a holder, comprising:

a flat plate-shaped attaching member (1) having a pinion rod (11) which rotatably penetrates and extends the attaching member (1) in the vertical direction;

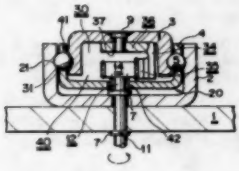
a long bed member (2) having a U-shaped cross section which is fixedly attached onto the upper surface of the attaching member (1) and has inner horizontal track grooves (21) for rolling members (5) on opposite inner wall surfaces of the bed member (2);

a long table member (3) having an inverse U-shaped cross section which has outer horizontal track grooves (31) for the rolling members (5) on outer wall surfaces of the table member (3) at the positions which face the inner horizontal track grooves (21) of the bed member (2) and is inserted into an inner cavity (20) of the bed member (2) so as to be away from the opposite inner wall surfaces of the bed member (2) with gaps and to be slidable in the longitudinal direction; and

a long holder (4) having a U-shaped cross section which is arranged between the inner wall surfaces of the bed member (2) and the opposite inner wall surfaces of the table member (3),

wherein a number of rolling member holding holes (41) for rotatably holding a number of rolling members (5) at regular intervals in horizontal lines between both of the opposite track grooves of the bed member (2) and of the table member (3) are formed in opposite walls of the holder (4), a center long hole (42) which extends in the longitudinal direction is formed in the bottom wall of the holder (4), a first rack (43) is formed on an edge surface of one side of the center long hole (42),

the upper portion of the pinion rod (11) is formed with a first



pinion (12) and a second pinion (14) which penetrate the bottom wall of the bed member (2) and the long hole (42) of the holder (4) and are projected from the long hole (42) and are come into engagement with the first rack (43), the first and second pinions (12, 14) are adjacently concentrically fitted and fixedly attached to the upper portion of the pinion rod (11),

a second rack member (32) having an almost J-shaped cross section which extends in the longitudinal direction is attached to the inner wall surface of the apex portion of the table member (3), a rack surface (33) is formed on the inner wall surface of the second rack member (32), in a state in which the second rack member (32) is attached to the inner wall surface of the table member (3), the rack surface (33) is come into engagement with the tooth train of the second pinion (14),

the teeth of the first and second pinions (12, 14) have a same shape, the number of teeth of the second pinion (14) is set to be twice as large as the number of teeth of the first pinion (12),

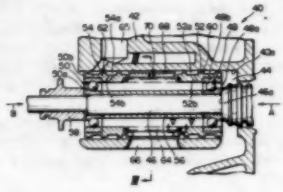
the rack surface (33) of the second rack member (32) is formed on the edge surface of an edge shelf-shaped portion (35) on the side a curved portion (34) of the J-shaped cross-sectional shape of the second rack member (32), and

a slit (38) having a wedge-shaped cross section which extends substantially in parallel with the rack surface (33) in the longitudinal direction is formed in the shelf-shaped portion formed with the rack surface, thereby applying elastic deforming characteristics in the lateral direction to the shelf-shaped portion (35) formed with the rack surface.

4,943,170
BEARING HOLDING ARRANGEMENT IN SUPERCHARGER

Masahiro Aida, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Apr. 20, 1989, Ser. No. 340,749
Claims priority, application Japan, Apr. 26, 1988, 63-55169
Int. Cl.[5] F16C *27/02*
U.S. Cl. 384—99 **9 Claims**

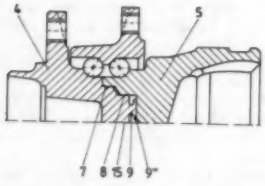


1. A bearing holding arrangement in a supercharger, comprising:
- a bearing housing;
- a pair of oil film dampers installed in a floating state in said bearing housing;
- a pair of ball bearings installed on said oil film dampers;
- a rotor shaft extending through said bearing housing and rotatably installed in same by way of said ball bearings and said oil film dampers;
- a spring urging said oil film dampers away from each other;
- a hollow, generally cylindrical thrust member disposed between said oil film dampers and abuttingly engageable with same selectively;
- a tangetial groove formed in said thrust member;
- a hole formed in said bearing housing and axially alignable with said groove when said thrust member is installed in place relative to said bearing housing: and
- a pin fitted in said groove and said hole.

4,943,171
WELDED CONNECTION FOR WHEEL BEARING UNIT FOR MOTOR VEHICLES

Heinrich Hofmann, Schweinfurt, and Manfred Tröster, Bad Kissingen, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Jan. 5, 1990, Ser. No. 461,227
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1989, 3902142
Int. Cl.[5] F16C *13/00, 43/04;* B21K *1/40*
U.S. Cl. 384—537 **13 Claims**

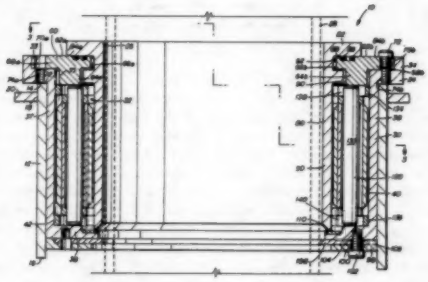


1. A wheel bearing unit for a motor vehicle, or the like, the bearing unit comprising:
- an outer ring having an outer race for rolling elements, at least one row of anti-friction rolling elements for rolling about the race of the outer ring;
- an axially more inward inner part; an axially more outward outer part, axially outward of the inner part;
- a respective inner race defined on at least one of the inner part and the outer part for cooperating with the outer race on the outer ring and with the rolling elements supported thereby for defining the races for the rolling elements;
- one of the inner part and the outer part having an axial projection thereon projecting axially toward the other of the inner part and the outer part, and the axial projection having an annular periphery with a plurality of different radius steps defined on it;
- the other of the outer part and the inner part having an axially extending sleeve defined thereon axially extending toward the one of the inner part and the outer part, and the sleeve having an internal bore with a surface which is stepped complementary to the stepped periphery of the axial projection, such that with the outer part and the inner part pressed axially together, the complementary steps come into engagement and orient the inner part and the outer part with respect to each other;
- the axial projection having an axially forward end toward the other of the inner part and the outer part; the sleeve bore having a bottom facing toward the axially forward end of the projection;
- an axially directed forward projection extending from one of the inner part and the outer part toward the other, located in the bore of the sleeve and extending into engagement with the axial end of the other of the outer part and the inner part, and the axially directed forward projection being welded to the other of the outer part and the inner part in the bore.

4,943,172
DRILL DECK BUSHING

William N. Waldrep, Midland, Tex., assignor to Drilco Industrial, Inc., Midland, Tex.

Filed Mar. 30, 1989, Ser. No. 330,628
Int. Cl.[5] F16C *33/34, 31/00*
U.S. Cl. 384—565 **25 Claims**



1. A shock absorbing guide bushing mountable in the drill deck of a drilling rig, comprising:
- a generally tubular outer shell adapted to be nonrotatably mounted in the drill deck;
- a generally tubular inner liner substantially coaxially and rotatably mounted within and spaced apart said outer shell forming an annular space therebetween, said inner liner having an inner bore adapted for receiving and guiding a drill string extending through the drill deck;
- shock absorbing cushion roller means disposed in said annular space between said inner liner and said outer shell for cushioning and absorbing lateral impact loads imparted to said inner linear by the drill string; and
- first retainer means disposed on said outer shell and engageable with second retainer means disposed on said inner liner for permitting said inner liner to rotate with respect to said outer shell while preventing axial separation of said outer shell and said inner liner.

4,943,173

SOUND DAMPENING IMPACT PRINTER

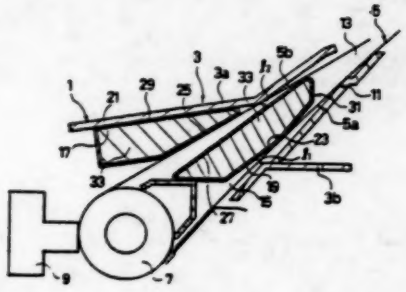
Yoji Okazaki, Yokohama; Yukami Nitta, Ohta, and Shigeyoshi Harada, Akishima, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 126,496, Nov. 30, 1987. This application Aug. 31, 1989, Ser. No. 401,513

Claims priority, application Japan, Nov. 29, 1986, 61-285066; Oct. 12, 1987, 62-254786

Int. Cl.[5] B41J 29/10

U.S. Cl. 400—689 8 Claims



1. A printer having a printing head for printing on paper supplied through an opening to the printing head in which noise is emitted from the printing head to the opening, comprising:

a feed path for guiding the paper from the opening toward the printing head and subsequently guiding the printing paper from the printing head toward the opening; and

at least one Helmholtz resonator disposed in said feeding path for reducing the cross-sectional area of said feeding path to a minimum area through which the printing paper passes, said helmholtz resonator having a resonant chamber with at least one hole therein, through which the resonant chamber communicates with said feed path so as to attenuate the noise power level at the exciting frequency of the printing head, and at least one said hole being concentrated, at one point in the noise emitting direction;

wherein the resonant chamber is divided in a plurality of parts such that each divided part has a volume V and at least one of the holes has radius a and depth l, such as satisfy the following equations:

$$f=C/2\pi x\ G/V$$

$$G=(\pi\pi a^2)/(l+\pi a/2)$$

f: one of integer multiples of the exciting frequency of the printing head at which maximum sound power appears;

C: sound velocity;

G: conductivity of the hole of the resonant chamber.

4,943,174

ARRANGEMENT FOR POSITION INDICATION OF AN EDGE OF A SHEET-SHAPED DATA CARRIER

Helmut M. Eicher, Wenden, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 10, 1989, Ser. No. 349,729

Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816367

Int. Cl.[5] B41J 29/42, 29/46

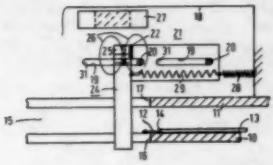
U.S. Cl. 400—703 15 Claims

1. An arrangement for position indication of an edge of a sheet-shaped data carrier, which is transportable in a transport direction in the space between two guide plates of a printing apparatus, said arrangement comprising:

a lever having a bearing end and means pivotally journalling said a bearing end for rotation generally in said transport direction;

a lever spring secured to the lever for opposing said rotation;

a sensor fixedly secured relative to the lever, said sensor and lever being arranged and aligned relative to one another such that the sensor is activated upon movement of the lever in response to the transport of the data carrier in said space;



a carriage moveable parallel to the transport direction between start and end stop positions; and

a carriage spring for opposing the displacement of the carriage in the transport direction;

said springs being so dimensioned such that the lever in response to engagement with the data carrier is displaced with the carriage in the transport direction to said end stop position and then pivoted after the carriage reaches said end stop position, said lever and carriage being returned to the start position after said lever pivots.

4,943,175

FEED MECHANISM FOR A WRITING DEVICE

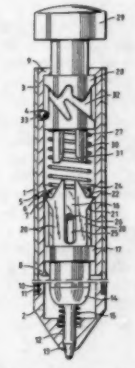
Otto Heim, Weigendorf, Fed. Rep. of Germany, assignor to A.W. Faber-Castell GmbH & Co., Stein, Fed. Rep. of Germany

Filed Jul. 17, 1987, Ser. No. 75,032

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1986, 3624152

Int. Cl.[5] B43K 24/08

U.S. Cl. 401—111 7 Claims



1. Feed mechanism for a writing device comprising a writing medium carrier which is fixable in a housing in a front and rear position and is influenced by the action of a return spring, wherein an axially and radially movable switching element and an axially movable locking element are arranged between the writing medium carrier and a press button which projects out of the housing at the rear end, characterized in that the writing medium carrier (14) rests at the locking element (16) which is supported in an elongated hole (25) by means of a transverse pin (26) so as to be fixed relative to the housing (1) with respect

to rotation, but so as to be axially movable in the housing (1), comprises a pressing column (23) and a spring arm (20) with a stop bevel (21) and a supporting surface (22), which is swivelable in the area of a supporting collar (7) in the housing (1) and carries a pressure spring (27) which is supported at the switching element (28) which comprises a continuously circulating switching cam (32) at its circumference, which switching cam (32) extends substantially parallel to the central axis of the writing device from a catch depression (34) to a reversing depression (37) and passes, in each instance, into a diagonal rotation path (39); and in that a carrier ball (33), which is inserted in a ball pocket (4) so as to be rotatable and fixed in this location, engages in the switching cam (32); and in that the switching element (28) comprises the press button (29) at its rear end and carries a switching fork (30) at the opposite end.

4,943,176

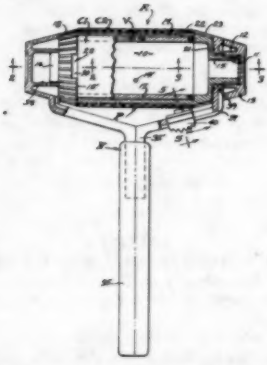
BODY ROLLER LIQUID APPLICATOR

Claudia Baker, 4441 Pacific Coast Hwy., Torrance, Calif. 90505

Filed May 15, 1989, Ser. No. 352,152

Int. Cl.[5] B05C *17/02*

U.S. Cl. 401—197 **13 Claims**



1. A body roller liquid applicator for storage and controlled discharge of liquid from its peripheral surface, and including;

inner and outer cylinder sections and one rotatably engaged coextensively over the other,

the inner cylinder section having one end wall with a trunnion projecting therefrom on a turning axis and having a cylinder wall open at its other end,

the outer cylinder section having one end wall with a trunnion projecting therefrom on said turning axis and having a cylinder wall open at its other end and rotatably receiving the cylinder wall of the inner cylinder section,

a seal seated at said open other end of the inner cylinder section and at said one end wall of the outer cylinder section and confined therebetween establishing a closed storage chamber in the cylinder sections,

there being an opening in the cylinder wall of the inner cylinder section and rotatable into alignment with a port in the cylinder wall of the outer cylinder section for controlled discharge of liquid,

and a handle extension having bearings engaged over the trunnions with the cylinder sections rotatable therebetween.

4,943,177

DOCUMENT ORGANIZER

Shelby A. Jordan, Corpus Christi, and John W. Apgar, Sr., Houston, both of Tex., assignors to Litigation Innovations, Inc., Houston, Tex.

Filed Nov. 4, 1988, Ser. No. 267,358

Int. Cl.[5] B42F *13/22*

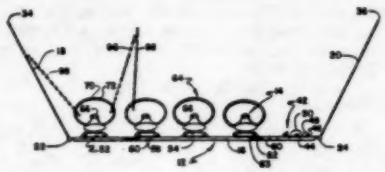
U.S. Cl. 402—72 **11 Claims**

1. A document organizer comprising

a rigid backing member having plural parallel receivers for ring binder assemblies;

a front cover and a back cover pivotally connected to the backing member for movement about spaced first and second generally parallel axes; and

a plurality of ring binder assemblies including a rigid central



segment in the receivers, a plurality of separable ring sets and means for latching the ring sets closed, the ring binder assemblies being free from rigid front and back covers parallel to the backing member front and back covers.

4,943,178

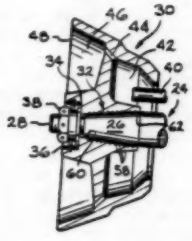
MOUNTING STRUCTURE FOR ROTATING BODIES

Richard Weinstein, Toledo, Ohio, assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed May 8, 1986, Ser. No. 860,928

Int. Cl.[5] B05B *5/02*

U.S. Cl. 403—259 **12 Claims**



1. A mounting structure for securely and accurately positioning an object on a rotatable shaft comprising:

a rotatable shaft member having an axis and adapted to be connected to a rotating drive means, said shaft member provided with a first tapered mounting portion;

an object securely mounted on said shaft member for rotation therewith, said object provided with an internal bore having a second tapered mounting portion engageable with said first tapered portion and cooperating with said first tapered portion to align said object with respect to said shaft member;

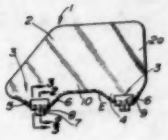
one of said first and second tapered mounting portions including a plurality of axially spaced apart and generally annular grooves defining a plurality of spaced apart tapered land surface portions therebetween, the other one of said firs and second tapered mounting portions defining a tapered surface engageable with said tapered land surface portions for securely and accurately positioning said object on said shaft member;

said one of said first and second tapered mounting portions including said grooves being formed of a first material, and said other one of said first and second tapered mounting portions being formed of a second material, said second material being substantially harder than said first material such that said tapered mounting portion formed of said first material deforms during assembly of said first and second tapered mounting portions to provide substantial contact and more accurate alignment between said mounting portions.

4,943,179
PLATE MEMBER ARRANGEMENT

Yoshio Horiki, Matsusaka, and Hideo Ikeda, Tokyo, both of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jun. 24, 1987, Ser. No. 66,710
Claims priority, application Japan, Jun. 27, 1986, 61-97580[U]; Jun. 27, 1986, 61-97581[U]; Jun. 30, 1986, 61-99147[U]
Int. Cl.[5] B25G 3/34
U.S. Cl. 403—269 12 Claims

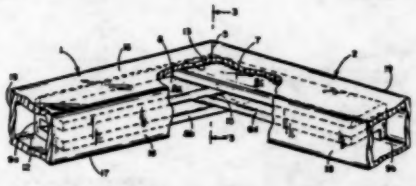


1. A plate member arrangement comprising:
a glass plate member;
a holder member contacting with said plate member to securely hold a peripheral part of said plate member, said holder member being made of plastic and being molded to cover said part of said plate member;
means for securely connecting said plate member with said holder member, said means including a projecting member which directly projects from said plate member outwardly into said holder member, said projecting member being independent from said holder member, said projecting member being integral with said part of said plate member and providing a hook-like connection with said holder member, said plate being integrally formed with a protruding part, said protruding part being integral with said projecting member.

4,943,180
INTERLOCKING CORNER PLUG SYSTEM

Paul P. Durhman, Winnebago, Minn., assignor to Advanced Fiber Products, Winnebago, Minn.

Filed Dec. 1, 1988, Ser. No. 278,557
Int. Cl.[5] F16B 7/00
U.S. Cl. 403—295 22 Claims



21. A structure for connecting a pair of adjacent end-to-end abutting tubular structural members, comprising:
a. a pair of elongated tubular members having abutting ends, each of said tubular members being disposed at an angle relative to the other of said tubular members;
b. a pair of elongated interengaging supporting connector inserts, each of which is constructed and arranged to be positioned within said abutting end of one of said tubular members, and to interengage with said other insert at a point adjacent said abutting ends of said tubular members, each of said inserts being configured cross-sectionally substantially identical to said other insert, said inserts interengaging whereby one of said inserts is invertedly disposed in relation to said other insert;
c. means for securing said inserts together in interengaging relation; and,
d. means for securing said tubular members together.

4,943,181
QUICK DISCONNECT WITH LOCKING FEATURE FOR PICK AND PLACE DEVICES

Patrick M. Murphy, Lake Orion, Mich., assignor to Mif-Sud Industries, Inc., Sterling Heights, Mich.

Filed Jul. 20, 1989, Ser. No. 383,403
Int. Cl.[5] G05G 5/06
U.S. Cl. 403—324 9 Claims

1. A locking quick disconnect device for connecting and disconnecting structural members, said locking quick disconnect device comprising:
a first structural member;
a second structural member located in proximity to said first structural member; including a cam member rotatable relative to said first structural member cam means mounted to said first structural member, said cam member having at least one cam track, said at least one cam track having a lock position and a release position;
a slidable rod mounted adjacent said cam member, said slidable rod being operatively associated with said cam member;
lever means mounted to said cam member, said lever means operatively associated with said member; and
a detent located at said lock position of said at least one cam track, said detent locking said cam member in said lock position;
whereby said slidable rod engages said second structural member thereby connecting said first structural member with said second structural member when said lever means acts to traverse said cam member from said release position to said lock position, said cam member being locked in said lock position by said detent, and said slidable rod disengages said second structural member thereby disconnecting said first structural member from said second structural member when said lever means acts to traverse said cam member from said lock position to said release position, said cam member being consequently released from said detent in said released position.

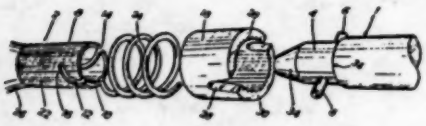
4,943,182
RAPID FASTENER OF THE BAYONET TYPE

André Hoblingre, Valentigney, France, assignor to ECIA - Equipements Et Composants Pour L'Industrie Automobile, Audincourt, France

Filed Mar. 14, 1989, Ser. No. 323,590
Claims priority, application France, Mar. 14, 1988, 8803290
Int. Cl.[5] F16B 7/20
U.S. Cl. 403—349 7 Claims

1. A rapid fastener of the bayonet type for connection of two elements, comprising a socket terminating the first element, a stem terminating the second element, the socket having an open end for receiving a stem, a laterally projecting pin on the outer surface of said stem, a slot in the socket, said slot having an open entrance end for the entrance of said projecting pin, guiding and locking means comprising a ring axially slidable

along the socket but rotating with said socket, spring means for biasing said ring toward the open end of said socket, a longitudinal slot formed in said ring and having an open end toward the open end of the socket, and two lateral walls progressively diverging toward said open end of the longitudinal slot; said longitudinal slot open end being laterally offset relative to said open entrance end of the socket slot and having an end edge



which partly closes said entrance end of the socket slot and which is urged back by the pin as the stem penetrates in said socket, said socket slot having an helical shape which causes helical relative motion of said penetrating stem and said socket and guides the pin to the entrance end of the longitudinal slot so that the end edge of said longitudinal slot is released and the ring is biased to a locking position in which the pin is trapped by edges of the two slots.

4,943,183

WIRE CLAMP

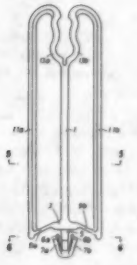
Yoshihito Nakano, Kasugai, Japan, assignor to Kitagawa Industries, Co., Ltd., Aichi, Japan

Filed Jul. 13, 1989, Ser. No. 379,201

Claims priority, application Japan, Aug. 10, 1988, 63-106128[U]

Int. Cl.[5] F16L *3/08*

U.S. Cl. 403—406.1 **6 Claims**



1. A wire clamp for holding a wire in place on a mounting board, comprising:

a central support member having an anchoring member that extends from a support base of the central support member and that has resilient engaging members that pass through and spread out in a mounting hole in the mounting board;

side support members on both sides of and parallel to the central support member and movable toward the central support member;

a pair of transverse support members extending angularly from opposed sides of the support base of the central support member toward the resilient engaging members, each transverse support member being connected to one end of an associated one of the side support members;

a wire-receiving means for receiving wire, the wire receiving means including two opposed portions, each portion connecting the other end of an associated one of the side support members with the central support member.

4,943,184

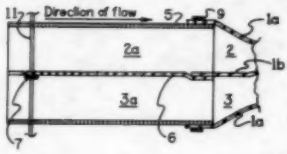
IRRIGATION DEVICE

Allan S. Humpherys, Kimberly, Id., and Elvert E. Oest, Fruita, Colo., assignors to The United State of America as represented by the Secretary of Agriculture, Washington, D.C. and Elvert Edgar Oest & Company, Fruita, Colo.

Filed Dec. 9, 1988, Ser. No. 281,733

Int. Cl.[5] E02B *13/00*

U.S. Cl. 405—39 **33 Claims**



1. An apparatus comprising a segment of elongated layflat tubing fabricated from flexible sheet material which becomes inflated to a cylindrical shape when filled with fluid, said tubing including a longitudinal diaphragm within said tubing which defines two parallel, elongated channels therein; a rigid pipe detachably connected to the upstream end of said tubing so that said channels are in communication with the interior of said pipe, flow control means connected to said pipe to stop the flow of fluids to either one of said channels while still permitting flow to the other of said channels, wherein said pipe is not fabricated of flexible sheet material.

4,943,185

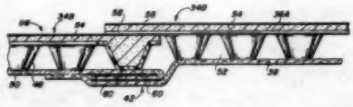
COMBINED DRAINAGE AND WATERPROOFING PANEL SYSTEM FOR SUBTERRANEAN WALLS

James P. McGuckin, 6032 E. Calle de Rosa, Scottsdale, Ariz. 85251; Dean L. Bradfield, 5104 Caroli La., La Canada, Calif. 91011; Raymond A. Foltz, 27137 Rio Bosque Dr., Valencia, Calif. 91355, and H. James Heidt, 2284 Waltonia Dr., #3, Montrose, Calif. 91020

Filed Mar. 3, 1989, Ser. No. 318,910

Int. Cl.[5] E02B *11/00*; E02D *19/00, 31/02*

U.S. Cl. 405—45 **18 Claims**



1. A combination drainage and waterproofing system for application to and protection of subterranean structures, such as walls, plaza decks or the like, the system comprising a plurality of composite panels, each of the plurality of composite panels further comprising:

a drainage core, said drainage core having a front surface and a back surface and a plurality of edges thereof, said front surface having a plurality of protrusions thereon, each of said plurality of protrusions having an apex on a front surface thereof, said plurality of protrusions forming interstitial passageways therebetween for permitting transverse flow of water across said front surface of said drainage core;

filter means for prevention of admission of earth particles into said interstitial passageways, said filter means being adhered to said apexes of said plurality of protrusions;

means for waterproofing said back surface of said drainage core; and

means for sealing at least one of said plurality of edges of said drainage core to an edge of a like adjacent drainage core, whereby a continuous waterproof surface is presented at said rear surface of a plurality of said drainage cores when said plurality of back surfaces of said drainage cores are placed adjacently against the subterranean structure, wherein said means for waterproofing said back surface of said drainage core comprises a flat peripheral flange formed on and as part of at least one edge of said drainage core, said flat peripheral flange being overlapped by a portion of an adjacent one of said drainage cores so that the front surface of said flat peripheral flange is brought into intimate contact with a portion of said back surface of said adjacent drainage core.

4,943,186

DEVICE FOR THE DISPLACEMENT OF SEDIMENT UNDER WATER AND PROCESS FOR THE USE OF SUCH A DEVICE

Reijer N. Van Weezenbeek, Torenweg 14, 3235 NS Rockanje, Netherlands

Continuation of Ser. No. 28,901, Mar. 23, 1987, abandoned. This application Mar. 29, 1989, Ser. No. 330,442

Claims priority, application Netherlands, Apr. 14, 1986, 8600941

Int. Cl.[5] E02B *3/02*

U.S. Cl. 405—73 **6 Claims**

1. A device for the displacement of sediment under water comprising a pipe having a longitudinal axis with outer ends thereon and a plurality of downwardly directed outflow openings spaced along said longitudinal axis, means for lowering said pipe under water to the bottom of said water having sediment to be acted upon, a source of pressurized water connected to said pipe thereby providing a flow of pressurized water out of said downwardly directed outflow openings which are in contact with said sediment on said bottom for liquefying said sediment, the improvement comprising:

longitudinally directed outflow openings positioned in the outer ends of said pipe for directing water from opposite ends of said pipe substantially in the direction of said longitudinal axis, said longitudinally directed outflow openings are positioned in said pipe at a level above said downwardly directed outflow openings whereby water from the longitudinally directed outflow openings is useful in liquefying deposits of sediment around quay walls, pilings and similar structure in harbors.

4,943,187

ROV INTERVENTION ON SUBSEA EQUIPMENT

Hans P. Hopper, Aberdeen, Scotland, assignor to British Petroleum Co. p.l.c., London, England

Filed Nov. 16, 1988, Ser. No. 272,192

Int. Cl.[5] F16L *29/00*

U.S. Cl. 405—190 **10 Claims**

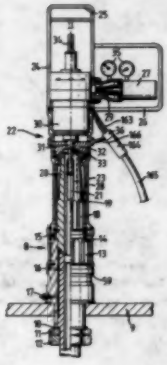
1. An actuation point and ROV-operable tool for actuating equipment of a sub-sea module, comprising:

(a) an actuation point which is a projection from a surface of the sub-sea module, said projection having two tool guidance surfaces of different external diameters, the larger diameter surface being nearer to the module than the smaller diameter surface,

(b) a ROV-operable tool having a hollow interior adapted to fit over said projection and having two surfaces of different internal diameters, the larger diameter surface being at the end of the tool adjacent the module and adapted to fit closely over the larger diameter surface of the projection, and the smaller diameter surface being adapted to fit closely over the smaller diameter surface of the projection and,

(c) means for actuating the equipment by action of the tool on the projection in which

the larger diameter surfaces of the tool and projection do not move and provide the means for holding the tool on the projection against the forces applied by the tool to the projection, and



the smaller diameter surfaces provide the means for actuating the equipment, said means being selected from

a torque function, said smaller diameter surface of the projection being a rotatable spigot rotatable by rotation of the smaller diameter surface of the tool,

a stab function, said smaller diameter surface enclosing a sleeve which is movable axially by axial movement of the smaller diameter surface of the tool, or

both torque and stab functions, said smaller diameter surface of the tool having both a rotatable portion and an axially moveable sleeve, the smaller diameter surface of the tool being both rotatable and axially movable.

4,943,188

ROTATING LUG ANCHOR CONNECTOR

George W. Peppel, Arlington, Tex., assignor to Lockheed Corporation, Calabasas, Calif.

Continuation-in-part of Ser. No. 196,258, May 20, 1988. This application Feb. 6, 1989, Ser. No. 307,053

Int. Cl.[5] E02D *5/74*; F16B *1/04*

U.S. Cl. 405—224 **10 Claims**

1. A connector for releasably securing the tether of a tension leg platform to the sea floor, comprising:

a first member secured to the sea floor;

a second member secured to the lower end of the tether;

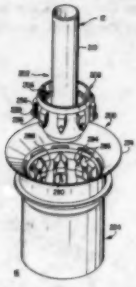
a ring having a central vertical axis, said ring having at least one load lug and at least one actuation lug, each lug extending horizontally from the ring along a radius centered on the vertical axis;

a cylindrical receptacle having a central vertical axis, said cylindrical receptacle having at least one load lug, at least a first and second upper guide and at least one lower guide, a vertical slot being formed between said upper and lower guides;

the ring being attached to one of said members and the cylindrical receptacle attached to the other of said members, the attachment of a selected one of said ring and cylindrical receptacle to the associated member permit-

ting rotation of said selected one about the vertical axis relative to the associated member; and

the lowering of the tether causing the actuation lug to contact the first upper guide, subsequent lowering of the tether causing the first upper guide to guide the actuation lug into and along the vertical slot and into contact with



the lower guide, the lower guide guiding the actuation lug to position the actuation lug under the second upper guide, upward movement of the tether engaging the actuation lug and second upper guide to guide the load lug on the ring under the load lug on the cylindrical receptacle to secure the tether to the sea floor.

4,943,189

METHOD OF CONTRUCTING A VERTICAL BARRIER WALL IN THE GROUND, AS WELL AS APPARATUS FOR APPLYING THIS METHOD

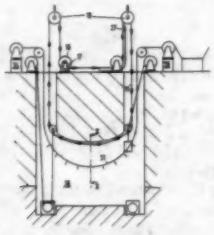
Alexander J. Verstraeten, Knokke-Heist, Belgium, assignor to Dutch Drilling B.V., Oostburg, Netherlands

Filed May 4, 1989, Ser. No. 347,462

Claims priority, application Netherlands, Mar. 6, 1989, 8900541

Int. Cl.[5] E02D *5/20*

U.S. Cl. 405—267 **11 Claims**



1. A method of constructing a vertical barrier wall in the ground, in which two spaced apart, deep wells are excavated in the ground, after which the soil material present between the two wells is removed, characterized by

excavating a substantially horizontal canal interconnecting the two wells near the bottom thereof,

installing in the two wells and the canal connecting said wells a looped, closed chain carrying excavators, the two ends of said chain being interconnected above ground level, and

driving the chain in a direction of circulation, while simultaneously moving the closed chain loop upwards and filling the trench formed thereby with a supporting fluid.

4,943,190

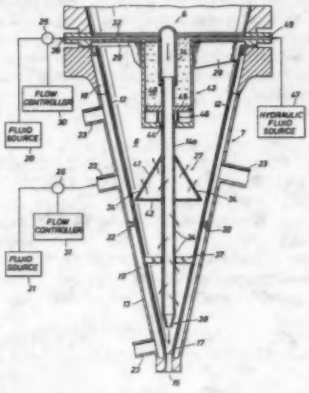
AERATION TUBE DISCHARGE CONTROL DEVICE WITH VARIABLE FLUIDIC VALVE

Thomas S. Dewitz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 21, 1988, Ser. No. 209,605

Int. Cl.[5] F23D *1/00*

U.S. Cl. 406—134 **20 Claims**



1. An apparatus for maintaining a uniform mass flow rate of a particulate solids and gas mixture discharged from a holding vessel to a receiving reactor, said apparatus comprising:

means for introducing said mixture into a containing means having a downwardly converging wall which forms at least one port at the apex thereof for discharging said mixture therefrom;

first tubing means movably secured within said containing means and in axial alignment with said discharge port;

second tubing means within said containing means slideably connected to said first tubing means such that the interior passages of said first and second tubing means are in fluid communication with each other;

means for selectively injecting gaseous fluid under pressure into said second tubing means;

a plurality of aeration ports selectively located in said first tubing means and communicating with the interior passageway therein for discharging said gaseous fluid into said particulate solids and gas mixture;

means for selectively moving said first tubing means in axial relation to said discharge port; and

means for discharging said particulate solids from said containing means.

4,943,191

DRILLING AND THREAD-MILLING TOOL AND METHOD

M. Norbert Schmitt, Schwalbenweg 3, D-8501 Feucht, Fed. Rep. of Germany

Filed Aug. 18, 1989, Ser. No. 396,449

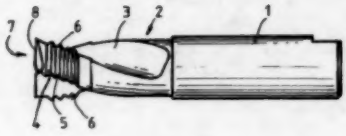
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1988, 3828780

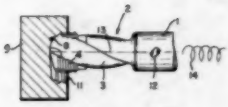
Int. Cl.[5] B23G *5/20*

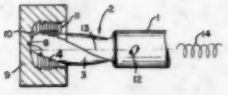
U.S. Cl. 408—1 R **3 Claims**

1. An axially extending drilling and thread-milling tool for forming a threaded bore and having a front end and a rear end spaced apart in the axial direction, an axially extending shank extending from the rear end toward the front end and arranged to be inserted into a driving means, at least one end cutting edge at the front end and extending perpendicularly of the tool axis and spaced from said shank, a milling region extending

axially between said shank and said end cutting edge, a plurality of lead free thread milling teeth formed in said milling region and spaced apart in the axial direction, said thread milling teeth arranged to form a helical thread in the bore, said end cutting edge having a radius extending outwardly from the axis of said tool, said thread milling teeth having a minor radius equal to or greater than the radius of said end cutting edge, the







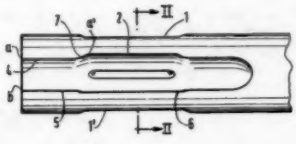
number of said thread milling teeth being less than the number of thread turns to be formed, said driving means arranged to drive said drilling and thread milling tools so that the axis thereof moves axially, rotationally and along a helical path for forming the core diameter hole in threads inclined relative to the tool axis, the number of thread turns corresponds to the number of orbits traversed in the movement along the helical path.

4,943,192

DRILL BIT HAVING A SHANK WITH GROOVES

Jean-Jacques Lafforgue, Tournon, and Claude Schwartz, Gournay S/Marne, both of France, assignors to Societe de Prospection et D'Inventions Techniques (S.P.I.T.)

Filed Jul. 25, 1989, Ser. No. 384,369
Claims priority, application France, Aug. 5, 1988, 88 10616
Int. Cl.[5] B23B *51/02*
U.S. Cl. 408—226 **4 Claims**



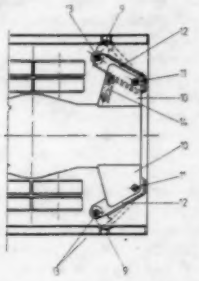
1. A drill bit, comprising:
two diametrically opposed locking grooves;
a first driving groove disposed substantially diametrically opposite a third locking groove; and
a second driving groove superimposed upon, and angularly offset in a circumferential direction with respect to, said third locking groove such that a first lateral edge of said third locking groove projects beyond a first lateral edge of said second driving groove, in said circumferential direction, so as to define therebetween drill bit locking projections, while a second lateral edge of said third locking groove is substantially co-linear with a second lateral edge of said second driving groove so as to be substantially merged therewithin within a drill bit driving zone while simultaneously effectively extending a drill bit friction zone so as to increase the wear resistance thereof and thereby enhance the service life of said drill bit.

4,943,193

LOADING TRAILER

Matti Koskinen, Toijala, and Pekka Brostrom, Oulu, both of Finland, assignors to Rautaruukki Oy, Oulu, Finland

Filed Jul. 6, 1988, Ser. No. 215,615
Claims priority, application Finland, Jul. 8, 1987, 873025
Int. Cl.[5] B60P *1/00*
U.S. Cl. 410—69 **2 Claims**



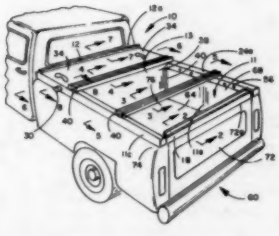
1. A loading trailer for picking up a flatbed, comprising:
a rigid chassis;
means for raising and lowering said rigid chassis; and
a pair of aligning guides pivotally coupled to the rear of said chassis and being symmetrically arranged in relation to the center line of said chassis, said aligning guides being pivotal about a vertical pivot and including a pair of arms, said arms being extendable about said pivot from a position generally aligned with the side of said chassis to a position extending obliquely outward from said chassis, and extending beyond the width of the main part of the chassis.

4,943,194

TRUCK CARGO SAFEGUARD

Alfonso Aguilar, 904 Bolivia, El Paso, Tex. 79903

Filed Aug. 31, 1988, Ser. No. 238,773
Int. Cl.[5] B60P *7/14*
U.S. Cl. 410—132 **1 Claim**



1. A modularized system for enclosing selected portions of a pickup truck bed, comprising:
at least one pair of vertical partition holders substantially

fixedly coupled to each interior side of the pickup bed selected equal distances from the front and gate of the pickup bed, the exterior surface of each holder defining a vertical slot therethrough on the interior side surface of the pickup bed, the vertical slots facing each other;

at least one vertical partition of height slightly less than the height of the pickup bed and of width such that the edges of the partition are slideably removably coupled within the vertical slots through opposing vertical partition holders;

a front frame substantially fixedly coupled along the entire front top edge of the pickup bed;

a pair of substantially symmetrical hollow receptacles, one fixedly coupled along the entire length of each top side of the pickup bed, the surface of each receptacle defining a plurality of identical dimension holes therethrough on the surface of each receptacle closest to the center of the pickup bed, the receptacles differing only in that one receptacle, called a locking receptacle has a locking spacer having surfaces defining locking holes, and the other receptacle, called the passive receptacle has a passive spacer having no holes;

a rear gate frame substantially fixedly coupled along substantially the entire width of the rear gate such as to form a rectangle with the front frame and the pair of locking receptacles when the gate is raised;

a sliding locking spacer disposed inside only the locking receptacle, the sliding locking spacer sliding between two positions, a locked position and an unlocked position, the locking spacer surface defining one hole therethrough for each hole through the locking receptacle and of substantially identical dimensions to the hole through the locking receptacle, the holes through the sliding locking spacer being disposed so as to form a straight line with pairs of holes through the receptacles when the locking spacer is in the unlocked position, and

a fixed locking spacer coupled within the locking receptacle.

4,943,195

EXPANSIBLE ANCHORING PLUG ASSEMBLY

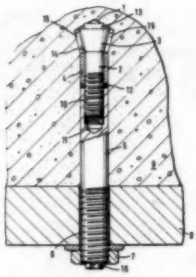
Artur Fischer, Waldachtal, Fed. Rep. of Germany, assignor to Fischerwerke Artur Fischer GmbH & Co. KG, Tumlingen, Fed. Rep. of Germany

Filed Jun. 7, 1988, Ser. No. 203,734

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719798

Int. Cl.[5] F16B *13/06*

U.S. Cl. 411—55 **12 Claims**



1. An anchoring plug assembly for anchoring an object in a hole having a widening undercut portion at a leading end thereof and pre-drilled in a supporting structure, comprising a bolt terminated with an expander cone which in an inserted position of the plug assembly acts on a bottom of said hole; an expansible sleeve having slots producing expansible sections over a part of a length of said sleeve, said sleeve surrounding said expander cone; and fixing means having a thread by which said fixing means is connected to said expander cone, said fixing means being rotated so that said expansible sleeve is pushed onto said expander cone whereby said expander cone acts on said expansible sections to expand them in said undercut portion, said expander cone having a leading end face and including at said end face at least one securing element which engages the in undercut portion of the hole to secure said expander cone against rotation.

4,943,196

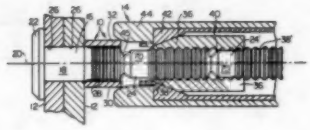
SWAGED COLLAR FASTENER

Warren Dahl, Philadelphia, Pa., assignor to SPS Technologies, Inc., Newtown, Pa.

Filed Aug. 20, 1987, Ser. No. 87,374

Int. Cl.[5] F16B *19/00*

U.S. Cl. 411—361 **33 Claims**



1. A fastener for securing a composite assembly of workpieces, comprising:

a fastener pin having a shank extending along a longitudinal axis of said fastener between a head and locking grooves about said axis; and

a fastener collar having a substantially cylindrical wall about said axis with at least one cavity disposed therein;

at least two workpieces being securable between said fastener pin head and said fastener collar with said fastener pin shank disposed through aligned holes in such work pieces and said fastener collar affixed to said fastener pin by radially compressing said cylindrical wall into said locking grooves, with each said cavity having a predetermined volume and being arranged on said fastener collar to receive material flowing from said cylindrical wall in non-radial directions throughout that compression operation and thereby establish a predetermined compression stress limit for that operation;

wherein at least one of said cavities penetrates through said cylindrical wall.

4,943,197

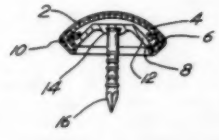
NON-PERFORATED NAIL BUTTON

Lenard Baritz, Highland Park, Ill., assignor to Handy Button Machine Company, Melrose Park, Ill.

Filed Aug. 25, 1989, Ser. No. 398,422

Int. Cl.[5] F16B *19/00, 33/00, 15/02*

U.S. Cl. 411—375 **2 Claims**



1. A nail button consisting of a metal button cap having an inward and downward slanting edge, a base assembly, and decorative material, the base assembly consisting of an attaching means having an outwardly tapered flat end, and a non-per-

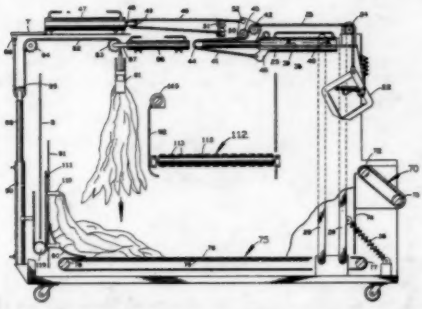
forated metal collet having a lipped recess which retains the tapered flat end of the attaching means, the non-perforated metal collect further having an upwardly and outwardly slanting peripheral edge, the inwardly and downwardly slanting edge of the metal button cap being attached to said peripheral edge, the decorative material covering the metal button cap and being held between the peripheral slanting edge of the collet and edge of the metal button cap.

4,943,198

APPARATUS FOR SEPARATING LAUNDRY ARTICLES

Stanley G. McCabe, Lubbock, Tex., assignor to Jensen Corporation, Fort Lauderdale, Fla.

Filed Sep. 5, 1989, Ser. No. 403,301
Int. Cl.[5] B65G 47/12
U.S. Cl. 414—13 **38 Claims**



1. In an apparatus for separating laundry articles from a pile of such articles, the combination of:

a housing having an entry end;

an inlet conveyor at said entry end of the housing operable to carry laundry articles into the housing from outside said entry end;

an entry clamp having selectively operable means for grasping a pile of laundry articles and for releasing said laundry articles;

operating means for selectively lowering and raising said entry clamp and for moving said entry clamp between a position inside said housing adjacent said entry end and a position outside said housing at said entry end;

said operating means being operable:

(a) to move said entry clamp from a raised position inside said housing to a lowered position outside said housing for engaging a pile of laundry articles outside the housing at said entry end; and

(b) after said selectively operable means in said entry clamp has caused said clamp to grasp laundry articles in the pile, to move said entry clamp to a raised position inside said housing adjacent said entry end;

said inlet conveyor being operable to carry into the housing the lower portions of said laundry articles hanging down from said entry clamp as said entry clamp moves from said lowered position outside said housing to said raised position inside said housing;

said selectively operable means in said entry clamp being operable to cause said raised entry clamp inside said housing to release said laundry articles;

a lower conveyor inside the housing for carrying the laundry articles, said conveyor having an entry end adjacent said entry end of the housing and an opposite exit end;

means providing a baffle at said exit end of said lower conveyor against which the laundry articles pile up;

a separator clamp above said lower conveyor having selectively operable means for grasping laundry articles and for releasing said articles;

means for lowering said separator clamp into close proximity to said baffle and for raising said separator clamp and moving it away from said baffle above said lower conveyor toward said entry end of the lower conveyor;

said selectively operable means in said separator clamp being operable to cause it to grasp laundry articles when lowered into close proximity to said baffle and to release said laundry articles and drop them onto said lower conveyor when raised and moved away from said baffle toward said entry end of the lower conveyor;

endless flexible chain means extending up past said baffle;

drive means for moving said chain means up past said baffle;

a plurality of removal clamps carried by said chain means at intervals along its length and movable in succession into engagement with the laundry articles piled against said baffle;

means for holding open each of said removal of clamps when it reaches the laundry articles piled against the baffle;

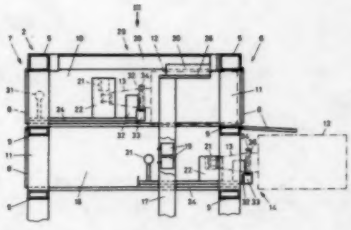
and means for closing each of said removal clamps as it moves up past the baffle to grasp one of said laundry articles piled against the baffle.

4,943,199

MACHINE TOOL STORAGE APPARATUS

Gerhard Hillen, Rorschacherberg, Switzerland, assignor to Starrfrasmaschinen AG, Rorschacherberg, Switzerland

Continuation of Ser. No. 24,302, Mar. 10, 1987, abandoned. This application Mar. 3, 1989, Ser. No. 318,722
Int. Cl.[5] B65G 1/10
U.S. Cl. 414—331 **5 Claims**



1. Machine tool storage apparatus comprising:

a modular tool magazine provided with a plurality of horizontally extending parallel separate compartments disposed vertically one above the other, said tool magazine being liftable and stackable on a like tool magazine;

a plurality of elongated tool units disposed in said compartments, each compartment containing a like number of said units, the units in each compartment being disposed in spaced side by side positions across the width of the compartment, each unit in any compartment being vertically aligned with the correspondingly positioned units in said vertically disposed compartments;

horizontally displaceable extracting means supporting each unit for enabling each unit to be rectilinearly separately moveable back and forth along the length of its compartment to either extend the unit out of its compartment into a position for subsequent transfer or to retract the corresponding unit back into its compartment, said extracting means including a like plurality of extracting devices, each extracting device being coupled to a corresponding unit via a corresponding retaining and positioning ring;

displacement means for selecting any one unit and moving said displaceable extracting means coupled to the selected unit to cause the selected unit either to be extended or to be retracted, said displacement means including a displacing mechanism coupled to said extracting means;

said displacement means including a plurality of horizontally spaced vertically extending arm means, each arm means being associated with a corresponding group of adjacent vertically and horizontally spaced tool units in all com-

partments, each arm means being adapted to be detachably connected to any selected unit in the corresponding group and being rectilinearly moveable back and forth along the length of the compartments;

the displacement means further including a pneumatic cylinder and means for connecting said cylinder to all arm means for moving all arm means back and forth simultaneously;

said connecting means including a crosspiece connected to all of said arm means;

each arm means being provided with a plurality of detachable coupling devices, each coupling device being associated with a corresponding one of the tool units in the corresponding group;

each extracting device supporting thereon a coupling catch having a slot;

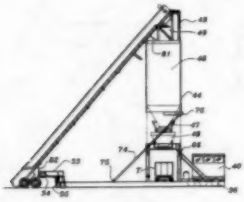
each coupling device including a drive means connectable to a pivotable coupling hook which can be locked in the slot of said coupling catch of a corresponding extracting device.

4,943,200

PORTABLE SELF-ERECTING ASPHALT STORAGE APPARATUS AND METHOD OF ERECTING SAME

M. Earl Edwards, Hixon, Tenn., and James G. May, Rising Fawn, Ga., assignors to Astec Industries, Inc., Chattanooga, Tenn.

Filed Jan. 12, 1989, Ser. No. 296,492
Int. Cl.[5] B65G 69/00
U.S. Cl. 414—332 **11 Claims**



1. A portable self-erecting storage apparatus for temporarily storing and dispensing asphaltic mix and the like and comprising:

a material conveying assembly comprising a supporting frame, an elongate material conveyor mounted to said frame and defining a material inlet and a material outlet end, wheeled ground engaging carriage means pivotally mounted to said frame adjacent said inlet end of said conveyor for permitting highway transport of said material conveying assembly and for permitting pivotal movement of said frame and said conveyor about a horizontal transverse first pivotal axis and such that said conveyor may be pivotally moved between an initial generally horizontal position and an upwardly inclined position wherein said outlet end is elevated,

a material storage assembly comprising an elongate main frame, wheeled ground engaging carriage means mounted to said main frame for permitting highway transport of said material storage assembly, a secondary frame including a forward end portion and an opposite rear end portion, with said rear end portion being pivotally mounted to said main frame for pivotal movement about a horizontal second pivotal axis, and a storage container mounted to said secondary frame and positioned between said forward and rear opposite end portions, and such that said secondary frame and said container may be pivoted about said second pivotal axis between an initial generally horizontal position and a vertical upright position, and lifting means mounted between said main frame and said secondary frame for pivoting said secondary frame and said container between said initial position and said upright position, and

interconnecting means for releasably and pivotally interconnecting said forward end portion of said secondary frame of said material storage assembly with said supporting frame of said material conveying assembly at a location adjacent said outlet end of said conveyor and while said material conveying assembly and said material storage assembly are each in their respective initial positions, and so as to permit relative pivotal movement about a horizontal third pivotal axis,

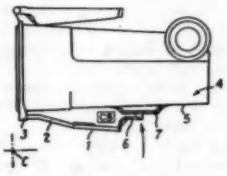
whereby the conveying assembly and the storage assembly may be longitudinally aligned with the outlet end of said conveyor being opposed to said forward end portion of said secondary frame, then interconnected by said interconnecting means for relative pivotal movement about said third pivotal axis, and with said first, second, and third pivotal axes being parallel to each other, and then collectively lifted by said lifting means to an operative position wherein said container is upright and said outlet end of said conveyor is elevated and disposed above said container.

4,943,201

MECHANISM FOR HANDLING GARBAGE PAILS

Jean Billon, Saint-Vallier, France, assignor to Compagnie Plastic Omnium, S.A., Lyons, France

Filed May 18, 1988, Ser. No. 195,619
Claims priority, application France, Apr. 15, 1987, 87 05394
Int. Cl.[5] B65F 3/04
U.S. Cl. 414—408 **2 Claims**



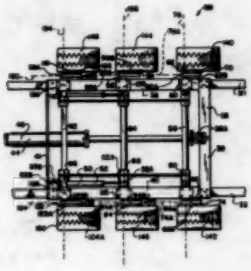
1. A gripping mechanism in a bin-dumping device for gripping portable waste bin bodies having planar frontal walls with collars at the upper end thereof to empty said bin bodies into a collection truck, said mechanism comprising a chassis connected to the dumping device, characterized by the fact that the chassis at upper portions thereof has at least one comb-shaped section adapted to be engaged under the collar provided at the upper end of the frontal wall of the bin body and the chassis having, at lower portion thereof, at least one suction cup support means adapted to contact the frontal face of a bin bodies; said one or more suction cup support means being controllable for being applied forcefully to the bin body during at least part of its displacement path during the operation of the dumping device; each support means being connected to a suction circuit including solenoid valves which place the one or more suction cup support means in communication with a vacuum pump adapted to be activated by a motor; said solenoid valves being controlled by contact switches, said contact switches being disposed in the displacement path of the dumping device; whereby said suction cup support means are controlled by said contact switches.

4,943,202

TILTING MOBILE PLATFORM

Donald Galloway, 7605 DeSoto Hwy., Bradenton, Fla. 33529

Filed Mar. 14, 1988, Ser. No. 167,846
Int. Cl.[5] B60P *1/18*
U.S. Cl. 414—475 **28 Claims**



23. A tilting mobile platform comprising:

a platform for supporting and carrying articles positioned thereon and having a first side, a second side, a first end and a second end;

an axle supporting frame having a first side and a second side with said first side being slidably secured to said platform first side and said second side being slidably secured to said second platform side such that said axle supporting frame slides between said first end and said second end of said platform;

a first axle having a first end and a second end with said first end of said axle being rotatably attached to said first side of said axle supporting frame and said second end of said first axle being rotatably attached to said second side of said axle supporting frame such that said axle is transversely mounted on said axle supporting frame relative to a path of movement of said axle supporting frame along said platform sides;

an axle supporting frame moving means for moving said axle supporting frame back and forth along said first and said platform sides between a first position wherein said axle supporting frame is positioned between said platform first end and said platform second end and a second position wherein said axle supporting frame is positioned proximate said platform first end;

first and second ground engaging wheels; and

means attached to said first and second axle ends for connecting said first and second ground engaging wheels respectively to said first and second axle ends, said attaching means including means for changing the distance between said platform and a center point of said ground engaging wheels.

4,943,203

RETRIEVER TRUCK

John Bohata, 25 Champlain St., Port Jefferson Station, N.Y. 11776

Filed Feb. 6, 1989, Ser. No. 306,420
Int. Cl.[5] B65G *67/02*; B60P *1/64*
U.S. Cl. 414—486 **7 Claims**

1. A vehicle having a flat bed for transporting a waste product container having fork receiving means which are normally located below said bed when container is at ground level comprising:

a. a groove formed in said bed extending along the central axis of said bed;

b. spaced tracks in the bottom of said groove extending the length of said groove;

c. carriage means mounted for travel on said tracks;

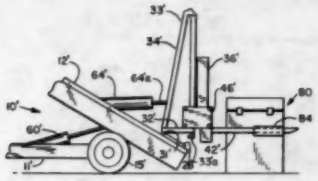
d. means for driving said carriage means along the length of said groove;

e. first vertically extending means mounted on said carriage means;

f. second vertically extending means located to the rear of and adjacent to said first vertically extending means, said second vertically extending means being movable vertically;

g. free floating means embracing both of said adjacent vertically extending means so that said vertically extending means remain adjacent each other and at the same time permit vertical movement of said second vertically extending means;

h. rearwardly extending fork means mounted on said second



vertically extending means capable of engaging said fork receiving means of said container;

i. means for actuating said second vertically extending means for vertical movement;

j. said second vertically extending means clearing the rear of said vehicle when said carriage means is moved to the rear of said vehicle, whereby said secodn vertically extending means can be lowered to engage a container at ground level, raise said container above the bed of said vehicle, and said carriage means can be moved toward the front of said vehicle so that said container can be lowered to rest completely on said bed; and

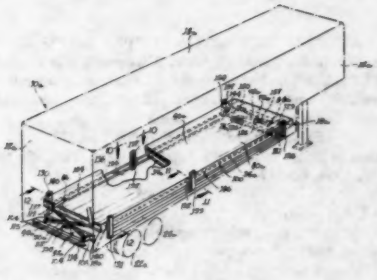
k. means for tilitng the bed of said vehicle to enable said fork means to engage said container at ground leverl without having to drop below the level of said bed.

4,943,204

DROP FRAME TRAILER CONSTRUCTION

Rodney P. Ehrlich, 1903 Tippecanoe Springs Rd., Monticello, Ind. 47960

Filed Nov. 30, 1988, Ser. No. 277,958
Int. Cl.[5] B60P *1/02*
U.S. Cl. 414—495 **11 Claims**



9. A vehicle comprising a mobile frame, side and top walls on said frame defining a cargo compartment of predetermined width and height, a floor assembly movable between a lowered positioned and a raised position for adjusting the height of said

compartment, lifting means between said frame and said floor assembly for raising and lowering said floor assembly, and retractable support means for supporting said floor assembly in the raised position, said support means including a shaft rotatably carried on said floor assembly and a plurality of finger elements carried by said shaft and movable between extended supporting positions and retracted in operative positions upon rotating of said shaft.

4,943,205

EARTH MOVING MACHINE

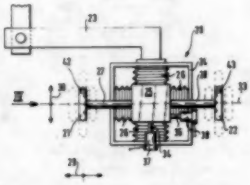
Heinz Schütt, Geibelstrasse 5, 7430 Metzingen, Fed. Rep. of Germany

Filed Oct. 28, 1988, Ser. No. 264,329

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1987, 3738281

Int. Cl.[5] E02F *3/28*

U.S. Cl. 414—680 **8 Claims**



1. An earth moving machine, comprising an earth moving tool; a plurality of drive elements arranged to move said earth moving tool in different directions; and control means operative for actuating said drive elements, said control means including a single control member which is freely movable from an initial position toward all sides and additionally turnable about at least one turning axle, said control means being further provided with at least one handle which is fixedly connected with said control member, said control means also having electrical sensors which respond to the movements of said control member in three mutually perpendicular directions and to the turning of the control member, said sensors being associated with said drive elements so that each of said drive elements causes a movement of said earth moving tool in a direction-synchronous manner with the movements and turning of said control member, said control member having a cubic shape, said control means including a housing mountable on a chassis of the earth moving machine and a plurality of spring bellows arranged at all six sides of said control member so that said control member is floatingly supported between said spring bellows in said housing, and urged toward a center of said housing.

4,943,206

AUTOMATIC CARTON SUPPLY METHOD

Masao Watanabe, Hachioji; Shuri Mizoguchi, Kunitachi; Satoshi Kawai, Sagamihara; Kiyohiko Takahashi, Sagamiko, and Toyokiti Tanimura, Akishima, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jun. 12, 1989, Ser. No. 364,272

Claims priority, application Japan, Jun. 16, 1988, 63-149487; Jun. 16, 1988, 63-149488

Int. Cl.[5] B65B *25/02*

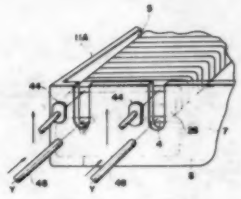
U.S. Cl. 414—786 **1 Claim**

1. The method of supplying a plurality of cartons to a carton-packaging machine, comprising the steps of

providing a plurality of flatened cartons stacked on edge in a line in a package so that two cutouts on each of said cartons are lined to form two grooves on two parallel sides of said stack;

inserting two bar-shaped means into said grooves respectively in the stacking direction of said cartons;

pressing said cartons to be together along the inserting direction of said bar-shaped means by a plurality of pressing means, being adjustable for different numbers of stacked cartons, so that the cartons are placed at the central portion of said bar-shaped means;



pulling out said cartons from said package with said bar-shaped means; and

supplying said cartons to said carton-packaging machine with said bar-shaped means.

4,943,207

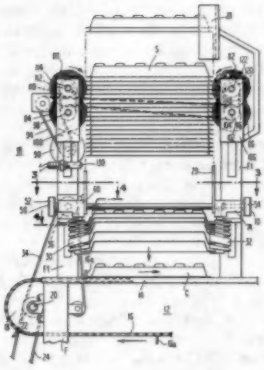
APPARATUS FOR DENESTING AND FEEDING CARTONS TO A CONVEYOR

Alexander R. Provan, Canandaigua, and David G. Vanderlee, Macedon, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 45,504, May 4, 1987, Pat. No. 4,867,632. This application May 22, 1989, Ser. No. 354,600

Int. Cl.[5] B65G *59/10*

U.S. Cl. 414—797.7 **1 Claim**



1. Apparatus for sequentially removing articles from a stack of nested articles and for controlling their movement to a location remote from the stack comprising:

(a) supporting means for supporting a plurality of the nested articles in a vertical stack; and

(b) denesting means positioned beneath said supporting means to receive the nested articles, said denesting means comprising a pair of feed screws positioned in spaced relation to receive opposite ends of the articles for support therebetween, each feed screw being of the opposite hand for counter rotation and provided with four different operating sections, the pitch in the first section of each feed screw matching the spacing of the nested articles, the length of the first section of each feed screw being sufficient to engage a plurality of the nested articles before any separation action of the feed screws begins so as to distribute the weight of the articles over a plurality of articles

rather than only the bottom article of the stack thereby avoiding distortion of the articles and permitting the lead edge of the feed screws to enter the nested stack, each of said feed screws having a second section having an increased pitch for separating the bottommost article of the stack, each of said feed screws having a third section in which the groove pitch is zero for 120° of screw rotation, and each of said feed screws having a fourth section with a pitch approximately equal to the pitch of the first section, the axis of said feed screws being inclined with respect to the vertical axis of the stack so that the grooves in said first section are substantially horizontal whereby the articles ride substantially flat in the grooves.

4,943,208

MULTI-STAGE LATERAL CHANNEL COMPRESSOR

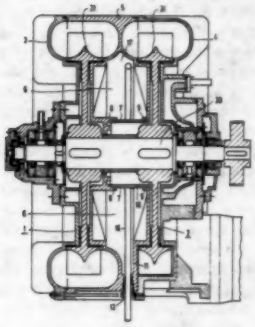
Siegfried Schoenwald, Bad Neustadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 11, 1989, Ser. No. 350,718

Claims priority, application Fed. Rep. of Germany, May 30, 1988, 3818374

Int. Cl.[5] F04B *5/00*

U.S. Cl. 415—175 **7 Claims**



1. A multi-stage lateral channel compressor comprising:

a plurality of compressor stages, each compressor stage including a housing comprising at least two housing shells and an impeller; the compressor stages being arranged axially one behind another and mechanically interconnected so as to form an interspace between the housings of the individual compressor stages;

a common driving shaft for driving the impellers of the individual compressor stages;

means for sealing the interspace both from the outside and also against the driving shaft;

a supply of coolant; and

an inlet orifice and an outlet orifice communicating the supply of coolant with the interspace, whereby coolant is supplied to the interspace via the inlet orifice, flows through the interspace and is evacuated via the outlet orifice.

4,943,209

HUB FOR A PLASTIC BLOWER IMPELLER

Richard F. Beehler, Franklin, Tenn., assignor to Heil-Quaker Corporation, Lavergne, Tenn.

Continuation of Ser. No. 217,402, Jul. 11, 1988, abandoned. This application Jan. 16, 1989, Ser. No. 464,561

Int. Cl.[5] F04D *29/20*

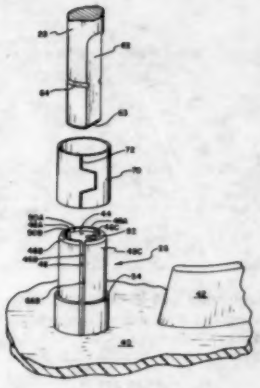
U.S. Cl. 416—204 R **11 Claims**

1. A combustion blower comprising:

a housing having first and second housing shell members secured together to define a housing cavity, said first housing shell member including an aperture;

a motor mounted on said first housing shell member, said motor including a rotatable driving shaft which extends into said housing cavity through said aperture in said first housing shell member, said driving shaft including an annular groove;

a rigid plastic blower impeller removably mounted on said driving shaft for rotation therewith, said blower impeller including a generally planar disk, a hub mounted on said



disk and having an end facing said first housing shell member, said hub including a bore in which said driving shaft is received, the wall of said bore including a rounded transverse ridge intermediate said disk and said hub end, said transverse ridge adapted to engage with said annular groove of said driving shaft, said hub including a plurality of axial slots, and a resilient expandable clamp surrounding and engaging said hub, whereby said driving shaft may be assembled into said bore while said clamp is engaged with said hub.

4,943,210

PUMP CONTROL SYSTEM, LEVEL SENSOR SWITCH AND SWITCH HOUSING

James R. Bailey, Jr., 2447 Lexington Rd., Lancaster, Ky. 40444, and Jean D. Ashcraft, 108 Robin Rd., Nicholasville, Ky.

Continuation-in-part of Ser. No. 252,764, Oct. 3, 1988, abandoned. This application Feb. 7, 1989, Ser. No. 308,934

Int. Cl.[5] F04B *49/00*

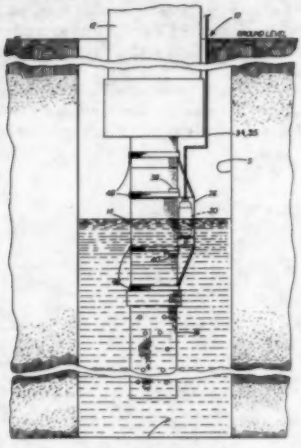
U.S. Cl. 417—12 **12 Claims**

1. A control system for a pump adapted for pumping liquid from an oil well shaft through a production string comprising:

a control circuit including timing means remotely located from said oil well shaft, said timing means maintaining operation of said pump for a predetermined period of time so as to pump a selected volume of liquid from said well and maintain substantially the same volume of liquid in said well at the end of each pumping cycle;

means for sensing the liquid level in said oil well shaft and

actuating said timing means in response to said liquid rising to a predetermined level; and



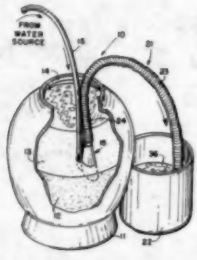
means for protecting said level sensing means from impact damage when said level sensing means is positioned in said oil well shaft.

4,943,211

SAND FILTER CLEANING SYSTEM

Alan D. V. Boegh, 201 Grace Blvd., Altamonte Springs, Fla. 32714

Filed Jan. 7, 1987, Ser. No. 1,043
Int. Cl.[5] F04F *5/44*
U.S. Cl. 417—131 **5 Claims**



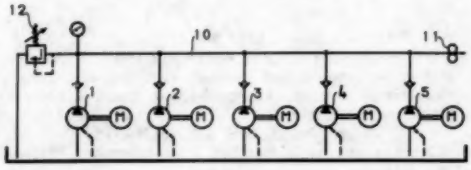
1. A sand filter cleaning system comprising in combination:
a suction head having an enlarged intake opening for sucking materials thereinto;
an exhaust hose connected to said suction head for receiving materials sucked through said suction head;
a water pressure hose connected between a water source under pressure and said suction head for directing water under pressure into said suction head;
said suction head having a jet nozzle positioned to direct water under pressure from said water pressure hose toward said exhaust hose to create a suction in said suction head opening, and said suction head having means to stir up material in the mouth of said suction head, said means having a second water pressure nozzle positioned to direct water under pressure in front of the opening of said suction head whereby sand and other materials can be removed from a sand filter with water under pressure; and
means for creating a siphon in said exhaust hose to increase the suction therein whereby the sand in the sand filter can be cleaned.

4,943,212

MEANS FOR FEEDING FLUID INTO A PRESSURE CONDUIT

Hubert Bernd; Pierre Helby, both of Lohr/Main, and Alfred Sitter, Gemünden, all of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Filed Nov. 23, 1988, Ser. No. 275,438
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740344
Int. Cl.[5] F04B *41/06*
U.S. Cl. 417—7 **15 Claims**



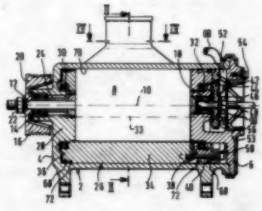
1. Means for feeding fluid into a pressure conduit while maintaining a substantially constant pressure independent of fluid throughput, the fluid feeding means comprising:
a master pump of variable delivery rate dischargeable into said pressure conduit, said master pump having an upper switching point and a lower switching point, both switching points predetermined between a minimum master pump delivery rate and a maximum master pump delivery rate; and
at least one variable displacement switching pump dischargeable into said pressure conduit, said at least one switching pump operable in either one of two switching pump end positions wherein the first end position corresponds to a minimum switching pump delivery rate of zero, and a second end position corresponds to a maximum switching pump delivery rate, said at least one switching pump switchable from one end position to another when a master pump delivery rate coincides with one of said switching points.

4,943,213

INTERNAL AXIS ROTARY PISTON MACHINE WITH MESHING ENGAGEMENT BETWEEN OUTER AND INNER ROTORS

Arno Förster, Worms; Gerhard Oberholz, Freinsheim, and Christiane Römuss, Beindersheim, all of Fed. Rep. of Germany, assignors to Aktiengesellschaft Kuehnle, Kopp & Kausch, Frankenthal, Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,545
Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716083
Int. Cl.[5] F04B *21/02*
U.S. Cl. 417—310 **10 Claims**



1. An internal axis rotary piston machine with meshing

engagement between an outer rotor surrounded by a housing and having n+1 recesses arranged between engagement parts and an inner rotor with n engagement parts which rotate uniformly at a speed ratio of (n+1):n when there is tooth-flank type contact between inside faces of the outer rotor and outside faces of the inner rotor so that working spaces are formed in the recesses of the outer rotor and move past inlet and outlet orifices of the housing, wherein the housing (2) is constructed in one piece with a pot-shaped form having a bottom (4) on the drive side, wherein said bottom (4) comprises an outer face for a bearing (30) of the outer rotor (26), particularly on a ring (28) extending axially into the end of the outer rotor (26), wherein the outer rotor (26) carries a sealing ring (68) at each of its axial ends, and wherein an annular groove (72) is provided at each axial end of said outer rotor, each said annular groove being positioned axially between the working spaces of said machine and one of the sealing rings (68).

4,943,214

TWO-SHAFT TYPE ROTARY MACHINE HAVING A TIP CIRCLE DIAMETER TO SHAFT DIAMETER WITHIN A CERTAIN RANGE

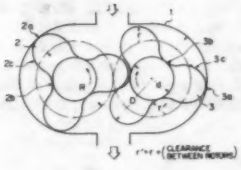
Yoshihiro Nilmura; Ritsuo Kikuta, and Katsuaki Usui, all of Tokyo, Japan, assignors to Ebara Corporation, Tokyo, Japan

Continuation of Ser. No. 243,630, Sep. 13, 1988, abandoned. This application Dec. 15, 1989, Ser. No. 449,420

Claims priority, application Japan, Sep. 19, 1987, 62-235274

Int. Cl.[5] F04C *18/18, 25/02*

U.S. Cl. 418—9 **2 Claims**



1. A two-shaft type rotary machine for use in producing vacuum comprises, a housing having a suction port, a delivery port, and a plurality of stages, each stage having two rotors in combination, said rotors being disposed within said housing and having respective shafts rotating in opposite directions to each other to deliver a gas from said suction port toward said delivery port:

wherein each of said rotors has tip and root portions defined by circular arcs, respectively, said tip and root portions being made smoothly continuous with each other through an involute curve, a clearance between said rotors being maintained at a substantially constant level, with the ratio D/d of the outer diameter D of the tip circle of each rotor to the shaft diameter d of the root circle being selected to fall within the range expressed as follows:

$$(n+1)/(n-1) \leqq D/d \leqq [1+\sin(180°/2n)]/[1-\sin(180°/2n)],$$

wherein n is the number of lobes of the rotor and $n \geqq 3$, said two shafts being elongated, and a plurality of rotors being provided on each of said shafts to constitute a plurality of stages.

4,943,215

MULTISTAGE VACUUM PUMP WITH BORE FOR FOULING REMOVAL

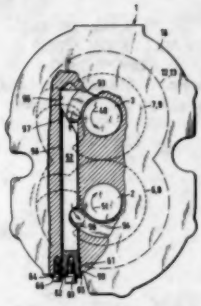
Hanns-Peter Berges, Cologne, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Feb. 17, 1989, Ser. No. 313,165

Claims priority, application European Pat. Off., Feb. 29, 1988, 88102986.2; Oct. 25, 1988, 88117706.7

Int. Cl.[5] F04C *18/18, 29/00*

U.S. Cl. 418—9 **9 Claims**



1. A multistage vacuum pump comprising:

a case;

at least two pump chambers in the case;

at least one passage in the case and connecting the pump chambers together;

a bore in the case leading outwards and including the passage; and

a plug for closing the bore, the plug including the longitudinal bore having an outer end, a tube section at the outer end of the bore, and a flange on the tube section.

4,943,216

SLIDING-VANE ROTARY COMPRESSOR

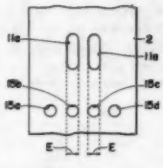
Masahiro Iio, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1989, Ser. No. 428,043

Claims priority, application Japan, Nov. 4, 1988, 63-278942

Int. Cl.[5] F04C *18/344*

U.S. Cl. 418—15 **6 Claims**



1. A sliding-vane rotary compressor comprising:

(a) a compressor body composed of a cylinder and a pair of side blocks attached to opposite ends of said cylinder;

(b) a rotor rotatably disposed in said compressor body and carrying thereon a plurality of radially movable sliding vanes, there being defined between said cylinder, rotor and vanes a plurality of compression chambers which vary in volume with each revolution of said rotor;

(c) a plurality of discharge holes formed in said cylinder and arranged in a direction parallel to a longitudinal axis of said cylinder;

(d) a plurality of discharge valves disposed on said cylinder and normally closing said discharge opening, respectively,

said discharge valves being displaceable to open the corresponding discharge openings when they are forced to open by a compressed fluid, thereby permitting a compressed fluid to flow out from said compression chambers;

(e) first valve-opening limiting means for limiting the opening of at least two endmost ones of said discharge valves to a first predetermined value; and

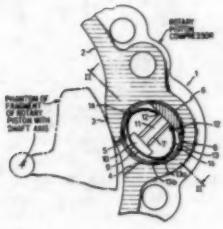
(f) second valve-opening limiting means for limiting the opening of the remaining discharge valves to a second predetermined value larger than said first predetermined value.

4,943,217

DELIVERY VALVE OF A ROTARY PISTON COMPRESSOR

Roland Nuber, Lindau, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin, Fed. Rep. of Germany

Filed Jan. 27, 1989, Ser. No. 303,542
Int. Cl.[5] F04C *29/08*
U.S. Cl. 418—270 **4 Claims**



1. In a pressurized gas delivery valve that includes a housing in the form of a cylindrical sleeve having valve slots that extend in a circumferential direction and in front of which are disposed cylindrically bent valve reeds that in an opening position rest against travel-receivers in an elliptically bent configuration, with said sleeve being disposed in a wall portion free of any screw fastening as fitted snugly directly of a rotary piston compressor for gaseous medium, said sleeve being disposed in said wall portion in a bore thereof that extends parallel to a shaft axis of said compressor, with said bore communicating with a respective delivery chamber of said compressor via delivery ports in said wall portion, and in the radial direction communicating on at least one side with a delivery line, comprising the improvement therewith wherein:

facing walls of said sleeve and said bore are recessed with milled cuts via a groove cutter in the vicinity of said valve reeds to form pockets to permit gaseous medium to flow about bulged-out portions of said valve reeds in said opening position thereof and to obtain a uniform transition of the walls of these pockets from inner surfaces of said sleeve.

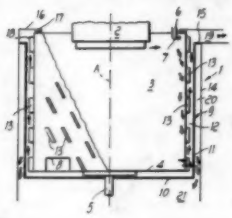
4,943,218

GRANULATION CHAMBER FOR EXTRUDERS OF MATERIALS SUCH AS PLASTICS

Giuseppina Sabbioni, Santa Maria Maddalena, Italy, assignor to A. S. T. Automatismi Speciali Termoplastici S. r. l., Occhiobello, Italy

Filed Sep. 8, 1988, Ser. No. 241,726
Claims priority, application Italy, Sep. 23, 1987, 3616 A/87
Int. Cl.[5] B29B *9/16*
U.S. Cl. 425—10 **13 Claims**

3. A granulation chamber for a material extruder, a head of the material extruder rotating about a vertical axis and projecting a plurality of material granules outwardly therefrom due to centrifugal forces created by rotation thereof, said granulation chamber comprising a rotatable cylindrical drum and a fixed sieve-like container, said rotatable cylindrical drum being disposed inside said fixed sieve-like container to thereby define therebetween a first chamber, said rotatable cylindrical drum being arranged with respect to the material extruder such that the plurality of material granules projecting from the material extruder strikes an inner face of said rotatable cylindrical drum, said rotatable cylindrical drum being provided with water supply means, said water supply means supplying water to the inner face of said rotatable cylindrical drum so as to mix water with the plurality of material granules, at least one opening being provided downwardly on said rotatable cylindrical drum, elevating means being provided inside said first chamber for raising the plurality of material granules inside said first chamber, said fixed sieve-like container being adapted to act as a sieve to allow exit of water from said first chamber while retaining the plurality of material granules in said first chamber, removal path means communicating upwardly with said



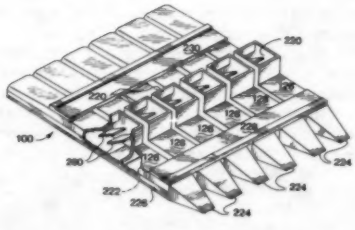
first chamber being provided for removal therefrom of said plurality of material granules, whereby cooling water and the plurality of material granules are joined at the inner face of said rotatable circular drum, rotation of said rotatable circular drum causes retention of cooling water with the plurality of material granules on the inner face of said rotatable circular drum while gravity causes the cooling water with the plurality of material granules to descend downwardly on the inner face of said rotatable circular drum, said at least one opening allows for exiting of cooling water and the plurality of material granules from inside said rotatable cylindrical drum into said first chamber, said elevation means cause raising of said plurality of material granules inside said first chamber to said overlying duct while said fixed sieve-like container allows for exiting of cooling water through said sieve-like container from said first chamber.

4,943,219

HOLLOW CORE CONCRETE EXTRUDER

Richard C. Nash, New Prague, Minn., assignor to Fabcon, Inc., Savage, Minn.

Filed Jul. 27, 1989, Ser. No. 385,785
Int. Cl.[5] B28B *1/14*
U.S. Cl. 425—64 **5 Claims**



1. In a slipform frame for use in forming concrete panels on a casting pallet which includes a floor and a pair of parallel side walls, said slipform frame having at least one slipform sus-

pended therefrom above the floor and between the side walls of said casting pallet, each of said slipforms having a pair of side walls and a top surface, each of said slipforms having a core shaping material receiving port located in the top surface thereof between front and rear portions thereof, the front portion of each of said slipforms having a closed bottom, while the remainder of said slipform has an open bottom, said slipform also including a closed extreme front portion in which the side walls and top and bottom surfaces of said slipform are tapered inwardly to form a markedly reduced cross sectional closed end; the improvement comprising:

at least one baffle plate member fixedly positioned within each of said core shaping material receiving ports at an angle such that core material entering said port is deflected toward the rear of said slipform.

4,943,220

APPARATUS FOR COOLING MELT SPUN FILAMENT BUNDLES

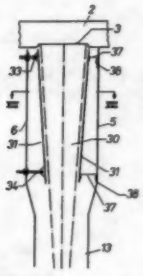
Franz Fourne, Alfter-Impekoven, Fed. Rep. of Germany, assignor to Fourne Maschinenbau GmbH, Bonn, Fed. Rep. of Germany

Filed Apr. 18, 1985, Ser. No. 724,560

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414602

Int. Cl.[5] D01D *5/092*

U.S. Cl. 425—66 **13 Claims**



1. Apparatus for cooling and solidifying a melt spun filament bundle, comprising:

a quench chamber having side walls;

a zone defined by the perimeter of a filament bundle to be quenched disposed between said walls;

an air rectifier positioned on one side of said zone and adapted to provide an air stream flowing across said zone;

each of said side walls being spaced at a constant distance of not more than 25 millimeters from the adjacent boundary of said zone and converging in the direction of air flow;

a pressure or plenum chamber located in front of said rectifier; and

an air permeable wall positioned on the side of said zone opposite said rectifier.

4,943,221

ROTATIONAL MOULDING MACHINE

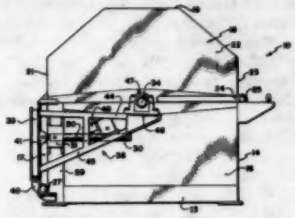
Peter Friesen, R.R.#1, Box 314, Group 24, Winkler, Manitoba, Canada (R0G 2X0)

Filed May 8, 1989, Ser. No. 349,359

Int. Cl.[5] B29C *41/06*

U.S. Cl. 425—73 **11 Claims**

1. A rotational moulding machine comprising a housing that encloses and defines a chamber for receiving and processing a mould, a spindle arm member having means thereon for attaching said mould thereto and being rotatable for rotatably moving said mould, support means for said spindle arm member and means mounted on said support means for driving said spindle arm member, and door means in said housing arranged for movement into an open position to allow access into said housing and into a closed position to fully close said housing for processing of said mould, said support means being



mounted to said door means for movement therewith such that movement of said door means into said open position cause the support means, the spindle arm member and the mould to be moved to a position exteriorly of the housing for loading and unloading the mould.

4,943,222

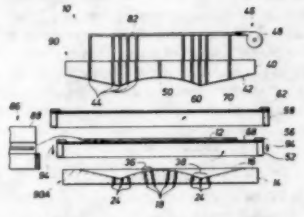
APPARATUS FOR FORMING PREFORMED MATERIAL

Nazim S. Nathoo, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 17, 1989, Ser. No. 338,683

Int. Cl.[5] B28B *21/38, 21/40*

U.S. Cl. 425—89 **2 Claims**



1. An apparatus for use in shaping fibrous preform material, said preform material coated with a sizing used to dimensionally stabilize said material after cooling of said sizing, said apparatus comprising;

a lower mold having non-planar lower mold surface, said non-planar lower mold surface having a first fluid lubrication opening defined therethrough placed in fluid communication with a first fluid lubrication means, said non-planar lower mold surface further including a vacuum/vent opening defined therethrough placed in fluid communication with vacuum/vent means, said non-planar lower mold surface having;

an upper edge section, and

a lower recessed section located at a lower elevation than said upper edge section, said first fluid lubrication opening defined through a portion of said upper section, said vacuum/vent opening defined through a portion of said lower recessed section,

an upper mold having a non-planar upper mold surface, said non-planar upper mold surface having a second fluid lubrication opening defined therethrough placed in fluid communication with a second fluid lubrication means, said non-planar upper mold surface further including a fluid vent opening defined therethrough,

a lower sheet frame having a first opening defined upwardly therethrough and having first clamp means located about the upper periphery thereof,

an upper sheet frame having a second opening defined upwardly therethrough and having second clamp means located about the upper periphery thereof, the inner periphery of said upper sheet fame sized to fit in close spaced relationship adjacent the outer periphery of said lower sheet frame, the inner periphery of said lower sheet frame sized to fit in close spaced relationship adjacent the outer periphery of said lower mold,

first seal means operatively engaged between said lower mold and said lower sheet frame to form a fluid-tight seal therebetween,

second seal means operatively engaged between said lower sheet frame and said upper sheet frame to form a fluid-tight seal therebetween,

a lower elastomeric sheet clamped about the upper periphery of said lower sheet frame by said first clamp means, said lower sheet forming a fluid-tight seal across said first opening, said lower sheet supporting said preform material,

an upper elastomeric sheet clamped about the upper periphery of said upper sheet frame by said second clamp means, said upper sheet forming a fluid-tight seal across said second opening,

a fluid cavity defined between said upper and lower sheets, said fluid cavity placed in fluid communication with fluid removal means capable of establishing a vacuum between said sheets,

a first fluid chamber defined between said lower mold surface and said lower sheet, said first fluid chamber being selectively placed in fluid communication with said vacuum/vent means and said first fluid lubrication means, and

a second fluid chamber defined between said upper mold surface and said upper sheet, said second fluid chamber being selectively placed in fluid communication with said second fluid lubrication opening and said fluid vent opening, portions of said non-planar lower mold surface and said non-planar upper mold surface shaped to cooperatively engage about said upper elastomeric sheet and said lower elastomeric sheet and thereafter shape said fibrous preform material after said preform material is positioned between said sheets.

4,943,223

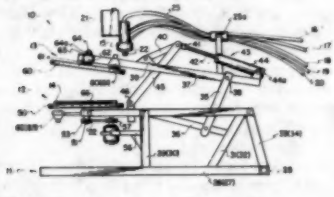
APPARATUS FOR MAKING FOAM PRODUCTS

Vincent E. Panaroni, 2330 Susan, Santa Ana, Calif. 92704

Division of Ser. No. 866,360, May 23, 1986, abandoned. This application Dec. 14, 1987, Ser. No. 133,134

Int. Cl.[5] B29C *39/08*

U.S. Cl. 425—116 **9 Claims**



1. Apparatus for producing products using polyurethane foams comprising

a support base;

a distribution plate assembly carried by the support base, said distribution plate assembly including a disk having a central distribution plate with a top surface and a peripheral wall thereon;

a clamping plate assembly having a disk;

a mold having a first surface engaging the peripheral wall of the central distribution plate, a second surface above said top surface of the distribution plate and an opening into the mold between the said first and second surfaces and aligned with the top surface of the distribution plate;

means mounting the clamping plate assembly to move the disk thereof into and out of clamping engagement with the mold, said means comprising a pivoted support arm and pivot links interconnecting the support base and the pivoted support arm, and motor means for pivoting the pivoted support arm and clamping plate;

means mounting the disk of the distribution plate assembly to rotate about a central axis of said distribution plate disk;

means mounting the disk of the clamping plate to rotate about a central axis of said clamping plate disk;

means to rotate the disk of the distribution plate assembly about said central axis thereof and to thereby rotate the mold and the disk of the clamping plate assembly; and

means to supply resin components to the center of the central distribution plate, wherein rotation of the central distribution plate will evenly distribute the resin components to the opening of the mold.

4,943,224

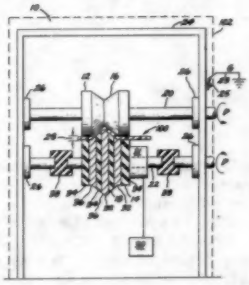
APPARATUS EMPLOYING INTEGRAL DIELECTRIC HEATER FOR ROLL FORMING THERMOPLASTIC MATERIAL

Herman F. Nied, Clifton Park, and Louis P. Inzinna, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 10, 1989, Ser. No. 308,495

Int. Cl.[5] B29C *35/14*

U.S. Cl. 425—174.8 R **9 Claims**



1. Apparatus for roll forming a thermoplastic material comprising:

a first rotatable roller having a forming surface, at least a portion of said first roller being electrically conductive;

a second rotatable roller having a forming surface, at least a portion of said second roller being electrically conductive, said second roller having a plurality of conductive disks spaced apart by a plurality of insulative disks, said first and second rollers being spaced apart and forming a gap therebetween, said first and second rollers being adapted to receive a thermoplastic material to be roll formed in said gap; and

a radio frequency generator means electrically connected to said second roller for application of a radio frequency electromagnetic field across said gap between said conductive portions of the first and second rollers for dielectric heating thermoplastic material exposed to said field between said rollers to a softening temperature.

4,943,225

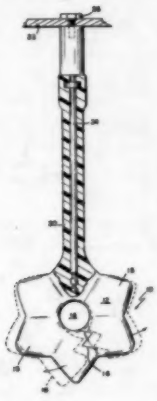
MANDREL FOR MAKING ELASTOMERIC ARTICLES

Ronald E. Prater, 2303 Sycamore Hills Dr., Fort Wayne, Ind. 46804

Continuation-in-part of Ser. No. 24,067, Mar. 10, 1987, Pat. No. 4,797,081. This application Jan. 3, 1989, Ser. No. 292,811

Int. Cl.[5] B29C *41/14*

U.S. Cl. 425—275 53 Claims



13. A mandrel for making a thin-walled elastomeric article by a dipping process, comprising:

a body portion formed of an elastically resilient material and having at least one through opening therein, and having a split extending from the opening through a first cross-section of the body portion, and having a cavity extending along a second cross-section of the body portion, wherein said cavity and said split are located on generally opposite sides of said through opening; and

means disposed in said cavity for exerting an outwardly directed force on a sidewall of the cavity, said force being directed against and transmitted into the body portion of the mandrel.

4,943,226

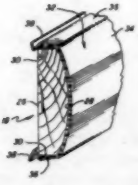
COVER FOR COLLAPSING BOARD

Earl T. Pottorff, 2436 Taylor Rd., Savannah, N.Y. 13146

Filed Sep. 19, 1988, Ser. No. 245,635

Int. Cl.[5] B29C *47/20*

U.S. Cl. 425—326.1 6 Claims



6. A collapsing board assembly of the type employed in the manufacture of polyethylene film comprising a frame; first and second arrays of collapsing boards the arrays facing one another and said boards being arrayed in parallel across a travel direction of the film to contact the latter and urge a tubular extrusion of the film to a flattened condition, each said collapsing board including an elongated rigid member of arcuate profile in cross section with top and bottom edges and a convex arcuate front face therebetween; each said collapsing board further comprising a cover in the form of an elongated channel of an extrudable plastic synthetic resin material filled with a lubricant agent, the channel having a convex arcuate web matching the arcuate front face of the associated collapsing board, upper and lower flanges at edges of said web matching the associated edges of the collapsing board, and lip members on free edges of said upper and lower flanges which snap-fit behind the collapsing board to retain the cover thereon.

4,943,227

COMPRESSING MACHINE FOR MAKING TABLETS

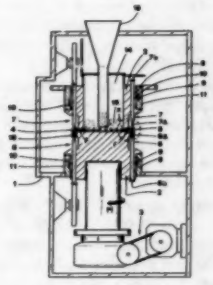
Libero Facchini, Bologna, Italy, assignor to I.M.A. Industria Macchine Automatiche S.p.A., Bologna, Italy

Filed Dec. 19, 1988, Ser. No. 286,160

Claims priority, application Italy, Dec. 30, 1987, 3746 A/87

Int. Cl.[5] B29C *39/08, 39/36*

U.S. Cl. 425—345 5 Claims



1. A compressing machine for the production of tablets, comprising: a base; a turret rotatable around its vertical axis mounted on said base, said turret defining a cylindrical chamber having a closed bottom coaxial with the axis of said turret; an annular cavity plate, fixed to said turret, with a plurality of holes through said annular cavity plate having axes parallel to the axis of said turret and spaced circularly in said annular cavity plate, said annular cavity plate defining means to expel the tablet; pairs of punches for each of said holes slidably mounted vertically on said turret, each of said pairs of punches comprising an upper and lower punch having a working head; guide means defined by said base for guiding the vertical sliding movement of said punches; said working head of each of said punches of each pair facing the working head of said other punch of said pair and positioned to fit simultaneously in said hole; an infeed device mounted on the base for introducing material in powder or granular form into said chamber; a radial channel defined by said turret and cavity plate extending from said chamber to each of said holes; and means to rotate the turret and thereby guide said punches of each pair, to allow the filling of a portion of each hole with material, the compressing of the material in each hole and the expelling of the tablet from the hole.

4,943,228

BLOW MOLDING MACHINE

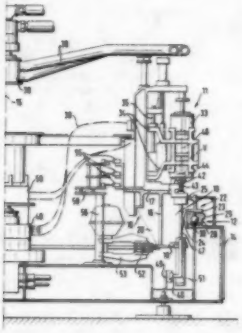
Wolfgang Reymann; Heiko-Ulrich Gropp, both of Hamburg; Klaus Vogel, Barsbüttel, and Hartwig Müller, Lüdtjensee, all of Fed. Rep. of Germany, assignors to Krupp Corpoplast Maschinenbau GmbH, Hamburg

Filed May 2, 1989, Ser. No. 346,524

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815194

Int. Cl.[5] B29C *49/36*, *49/64*

U.S. Cl. 425—526 13 Claims



1. A blow molding machine comprising:

a rotatably driven blowing wheel having a vertical axis, a peripheral wheel ring having an outer periphery positioned a radial distance from said axis, and an interior elevated clearance radially positioned between said axis and said peripheral wheel ring,

a plurality of blow molding stations mounted on said peripheral wheel ring, each station of said plurality spaced a distance apart from each other and each station having a blow mandrel for carrying a parison made of thermo plastic material into a blow mold of said station for blowing a hollow article,

a peripheral bearing means stationarily positioned at a point immediately adjacent said outer periphery substantially adjacent a rotational path of said plurality of blow molding stations on said peripheral wheel ring, said peripheral bearing means for maintaining said rotational path and plurality of blow mold stations stable.

4,943,229

BLOW MOLDING MACHINE

Wolfgang Reymann; Heiko-Ulrich Gropp, both of Hamburg; Klaus Vogel, Barsbüttel; Hartwig Müller, Lüdtjensee, and Walter Wiedenfeld, Hamburg, all of Fed. Rep. of Germany, assignors to Krupp Corpoplast Maschinenbau GmbH, Hamburg, Fed. Rep. of Germany

Filed May 2, 1989, Ser. No. 346,467

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815192

Int. Cl.[5] B29C *49/36*, *49/58*

U.S. Cl. 425—535 12 Claims

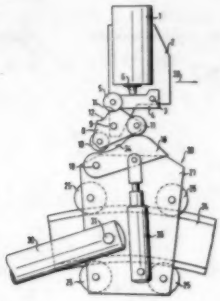
1. A blow molding machine comprising:

a wheel rotatably supported about a vertical axis,

a drive means for rotating said wheel,

a plurality of blow mold stations mounted on a periphery of the wheel, each station of said plurality of stations comprising a blow mold, a blowing mandrel carrying a parison made of thermo plastic material to be inserted into said blow mold and blown to a hollow article, and at least one valve having a plunger for supplying blowing fluid to said blow mold,

a plurality of carriages adjustably mounted on a stationary ring provided interior to the periphery of the wheel, and



a cam adjustably mounted on each carriage of said plurality of carriages for actuating said at least one valve.

4,943,230

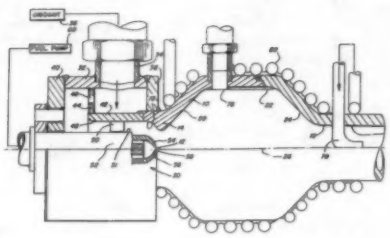
FUEL INJECTOR FOR ACHIEVING SMOKELESS COMBUSTION REACTIONS AT HIGH PRESSURE RATIOS

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 11, 1988, Ser. No. 255,966

Int. Cl.[5] F23M *9/00*

U.S. Cl. 431—183 7 Claims



1. A hot gas generator comprising:

a housing including an interior combustion chamber having a diverging interior wall that is generally a surface of revolution;

an axially directed opening centered in said wall;

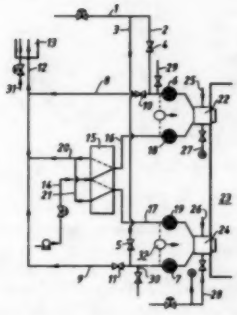
an outer, oxidant inlet in said opening and including swirler vanes for introducing into said chamber at said interior wall a swirling, hollow body of oxidant such that centrifugal force will create a diverging hollow body of swirling oxidant on said interior wall; and

a central liquid fuel inlet within said opening and said oxidant inlet and generally concentric therewith, said fuel inlet including means comprising swirler vanes for introducing a swirling hollow cone-like body of atomized liquid fuel into said chamber such that the outer surface of said cone-like body is on the inner surface of said diverging body from substantially the point of initiation of the latter to minimize mixing between said bodies.

4,943,231
REGENERATIVE BURNER SYSTEM

David P. Jenkins, Crynant, and James T. Edmundson, Seaniss, both of United Kingdom, assignors to British Steel plc, London, England

Filed Dec. 12, 1988, Ser. No. 283,389
Claims priority, application United Kingdom, Dec. 24, 1987, 8730171
Int. Cl.[5] F23D 11/44
U.S. Cl. 431—215 6 Claims

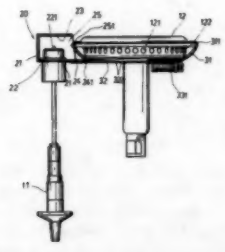


1. A regenerative burner system for a furnace comprising at least two burners alternatively fired and each having an air and gaseous fuel supply thereto traversing separate heat exchangers, the burners and heat exchangers being arranged such that the hot gases are exhausted from the furnace through the quiescent burner during firing of one burner, traverse the heat exchangers associated with the quiescent burner, relinquishing heat thereto during the firing cycle of the burner, wherein said gaseous fuel supply supplies gaseous fuel of low calorific value, essentially devoid of hydrocarbons, wherein alternating the firing by extinguishing one burner and firing the other burner is effected in dependence on the temperature of the gases exhausted through the heat exchanger associated with the quiescent burner immediately before such alternation and wherein any residual fuel in the supply lines and heat exchangers associated with the firing burner are purged through means for purging that burner by an inert gas supplied form a source of inert gas as it is extinguished.

4,943,232
IGNITION DEVICE FOR A GAS BURNER

Whang-Tung Lin, Fl. 2, No. 291-1, Pei-Tun Rd., Taichung City, Taiwan

Filed Jan. 24, 1990, Ser. No. 469,133
Int. Cl.[5] F23Q 3/00
U.S. Cl. 431—263 7 Claims



1. An improved ignition device for a gas burner having a burner casing with at least one flange member outwardly and radially extending from the burner casing and a plurality of flame holes below said flange member, said ignition device including an electrode, a spark generator for inducing a spark in said electrode, a housing for said electrode, a fastening means for fixing said housing to the gas burner, and improvements, wherein :

said housing includes a top plate, a bottom plate with a mounting hole for said electrode, and a pair of side plates on two opposing sides of said bottom plate, each of said side plates having an edge with a notch formed thereat, said notches of said side plates being adaptable to engage with the flange member.

4,943,233
USE OF DEWATERED OF DIGESTED SEWERAGE SLUDGE AS THE BLOATING AGENT

Manuel C. Diaz, Ontario, Calif., assignor to Recycled Energy, Inc., Los Angeles, Calif.

Filed Oct. 17, 1989, Ser. No. 422,623
Int. Cl.[5] C04B 18/00, 20/00, 24/00, 38/00
U.S. Cl. 432—13 1 Claim

1. A process to produce light-weight expanded shale aggregates using basic ingredients of shale and dewatered digested sewerage sludge as a bloating agent and high-lime blast furnace slag as fluxing agent and also using refuse derived fuel as a main fuel in the kiln, comprising the steps of

Crushing, grinding and mixing said shale dewatered digested sewerage sludge and high-lime blast furnace slag in a conventional rock crusher and ball mill, producing a hydrated clay-like soil product,

Mixing said shale, dewatered digested sewerage sludge and high-like blast furnace slag in weight proportion, as follows:

60% dewatered digested sewerage sludge,

30% shale,

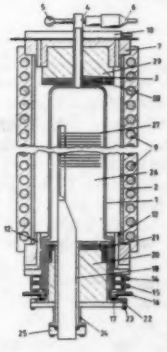
10% high-lime blast furnace slag,

Burning the hydrated clay-like soil product in a vertical kiln or rotary kiln at 2000° C. using refuse derived fuel and producing light-weight expanded shale aggregates.

4,943,234
PROCEDURE AND EQUIPMENT FOR THE THERMAL TREATMENT OF SEMICONDUCTOR MATERIALS

Heinrich Söhlbrand, Wirtsbauernstrasse 26,, D 8021 Neuried bei Mëchen, Fed. Rep. of Germany

Filed Feb. 23, 1989, Ser. No. 314,460
Int. Cl.[5] F27B 9/04
U.S. Cl. 432—152 11 Claims



1. An apparatus for the thermal treatment of semiconductor materials in diffusion furnaces, in particular for low, middle

and high temperature treatment, including a double-walled process tube open on the loading side with a liquid rinsing system provided in an annulus formed between the tube walls, a cantilever construction for loading the semiconductor discs to be treated into the process tube and a process gas feeder at the rear end of the process tube with disposal of this gas on the loading side, comprising an isothermic process chamber (26), which is completely surrounded by heating elements (9, 20, 28), said heating elements including a heating cassette (9) which cylindrically surrounds an outer tube (1) and a heating element on a loading side (20) integrated into the cantilever system (18 to 25) and is moveable, and a second heating element (28) arranged in a first rear, stationary vestibule block (7), said vestibule block (7) housing both a gas drainage connection piece (3) and an insert gas rinsing system (10) with a crown of gas inlet nozzles (11) arranged in the space between the inner process tube (1) and the outer tube (2), and a second vestibule block (8) equipped with the moveable cantilever system (18–25) and a rinsing gas system (10–12) with a crown of outlet nozzles (12).

4,943,235

HEAT-TREATING APPARATUS

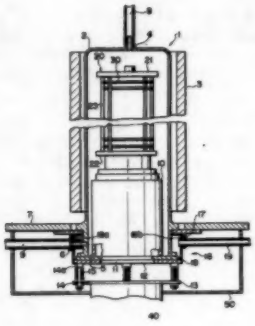
Ken Nakao, Sagamihara; Seishiro Sato, Machida, and Wataru Ohkase, Sagamihara, all of Japan, assignors to Tel Sagami Limited, Kanagawa, Japan

Filed Nov. 25, 1988, Ser. No. 275,966

Claims priority, application Japan, Nov. 27, 1987, 62-299228; Dec. 30, 1987, 62-334098

Int. Cl.[5] F27D *3/12*; F27B *5/04*

U.S. Cl. 432—205 **10 Claims**



1. A heat-treating apparatus comprising:

a furnace, which includes a furnace body, for storing an object to be heat-treated, having an opening for allowing the object to be loaded therethrough, an inlet port for feeding a reaction gas, and an exhaust port for exhausting a waste gas, and heating means for heating the object;

capping means positionable for making tight contact with said furnace body at an area of contact for capping said opening, said capping means being separable from said opening for allowing the object to be loaded therethrough before heat treating;

sealing means forming an enclosed volume around said area of contact for preventing the waste gas leaking from between said furnace body and said capping means from being diffused around said furnace; and

gas exhaust means, coupled to said exhaust port, for introducing the waste gas including the waste gas leaked into said enclosed volume, outside said heat-treating apparatus.

4,943,236

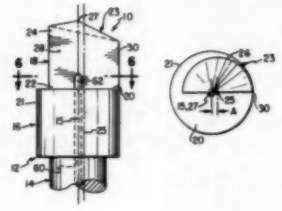
ASYMMETRICAL BONE DRILL

Leonard I. Linkow, New York, N.Y.; Anthony W. Rinaldi, Philadelphia, Pa., and Michael Gambale, West Hanover, Mass., assignors to Vent-Plant Corporation, Inc., Philadelphia, Pa.

Filed Dec. 22, 1988, Ser. No. 289,853

Int. Cl.[5] A61C *3/02*

U.S. Cl. 433—165 **16 Claims**



1. A drill for forming a hole in material comprising:

a shank having a longitudinal axis;

a cutting element having a body with a longitudinal center axis extending between first and second ends, said first end of the cutting element being eccentrically connected to said shank in such a manner that the longitudinal axis of the cutting element is positioned at a predetermined distance from the longitudinal axis of the shank, a drill point being located at said second end of the body, said drill point being concentric with the longitudinal axis of the shank, an outer surface of the body of said cutting element being defined by at least a front surface and a rear surface intersecting each other along at least a cutting edge, the rear surface being tapered toward the longitudinal axis of said shank such that during rotation of said shank in the material to form the hole, only the cutting edge and said drill point engage the material and a substantial open area exists between the outer surface of the cutting element and the hole.

4,943,237

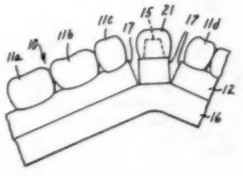
THERMOSET-THERMOPLASTIC MOLDED ARTICLE FOR DENTAL RESTORATION

Thomas T. Bryan, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 932,005, Nov. 18, 1986, Pat. No. 4,850,871. This application Jan. 26, 1989, Ser. No. 303,080

Int. Cl.[5] A61C *11/00*

U.S. Cl. 433—213 **2 Claims**



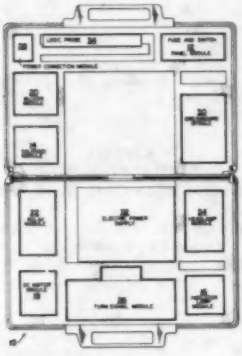
1. A hardenable model of an object useful for making a restoration for the object, said model having at least one surface portion of thermosetting resin which is not substantially thermoset, said model further comprising molten thermoplastic resin in contact with said thermosetting resin, said thermoplastic resin being cleanly breakable at room temperature upon hardening.

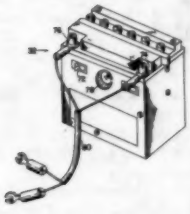
4,943,238

AUTOMOTIVE ELECTRONIC INSTRUCTIONAL AND DIAGNOSTIC TRAINING APPARATUS

Frank Gregorio, Ansonia, Conn., assignor to Interplex Electronics, Inc., New Haven, Conn.

Filed Dec. 14, 1988, Ser. No. 284,303
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—224 4 Claims





1. An automotive electronic instructional and diagnostic training apparatus comprising:

a group of electronic circuit modules, each module having at least one circuit path which simulates at least a portion of an automotive electronic circuit in a group of automotive electronic circuits;

electrical power supply means electrically connectable to said modules for providing electrical power to said modules to activate their respective circuit paths, said electrical power supply means comprising, means for selectively providing a voltage potential which corresponds to the normal voltage potential output of an automotive battery when the enging is off and an increased voltage potential which corresponds to the normal voltage potential output of the automotive battery when the engine is running; and

each module further including means for creating at least one fault condition representative of an electrical malfunction in said module.

4,943,239

TEST ANSWER AND SCORE SHEET DEVICE

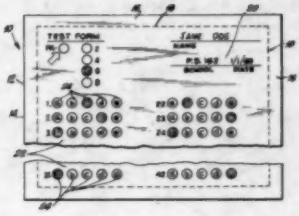
Betram L. Koslin, Yorktown Heights, N.Y., assignor to Touchstone Applied Science Associates, Inc., Brewster, N.Y.

Filed May 5, 1989, Ser. No. 347,998
Int. Cl.[5] G09B *3/08*
U.S. Cl. 434—353 23 Claims

1. An answer and score sheet device, comprising:

markable sheet means having at least one surface with answer mark guide indicia on said surface, for defining first positions on said at least one surface at which marks can be made selectively by a respondent in response to corresponding questions; and

said sheet means having a surface on which a number of discriminable flag indicia are formed at certain second



positions in determined orientations with respect to said first positions, each of said flag indicia being identifiable with one of at least two different test forms;

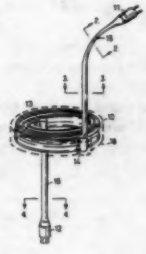
wherein the formation of said flag indicia corresponds to correct responses to said questions in accordance with a selected one of the different test forms.

4,943,240

ELECTRICAL CONNECTION

Leif E. Karlsson, Alingsas, Sweden, assignor to General Engineering (Netherlands) B.V., Netherlands

Filed Jul. 17, 1989, Ser. No. 380,443
Claims priority, application Sweden, Jul. 18, 1988, 8802665
Int. Cl.[5] H01R *35/04*
U.S. Cl. 439—15 11 Claims



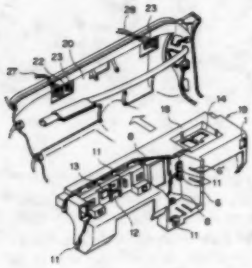
1. An electrical connector, said connector comprising a continous flat cable extending throughout the connector, said flat cable comprising conductors encased in a first insulative sheath having dimensions of width and thickness, with the width being greater than the thickness, a central portion of said flat cable being coiled into a plurality of turns which define a flat spiral, said cable being coiled so that said cable is place on edge the edges of said cable lying in two parallel planes, said cable having two end portions and two bent portions adjacent to said end portions, said bent portions being bent so that said end portions of said cable project outwardly from the spiral and substantially perpendicularly to said parallel planes, said end portions of said cable each being encased in a flexible one-pieces extra sheath which extends along the whole length of a respective one of said projecting end portions and which also extends past a respective one of said bent portions of the cable along part of said spiral.

4,943,241

APPARATUS FOR INSTALLING A WIRE HARNESS

Mitsugu Watanabe; Kazuhiko Kaneko, and Etsuji Matsumoto, all of Kosai, Japan, assignors to Yazaki Corporation, Japan

Division of Ser. No. 884,174, Jul. 9, 1986, Pat. No. 4,750,265.
This application Feb. 19, 1988, Ser. No. 158,324
Claims priority, application Japan, Feb. 18, 1986, 61-031910
Int. Cl.[5] H01R *33/00*
U.S. Cl. 439—34 **12 Claims**



1. An apparatus for installing a wire harness by securing the same within an automobile and connecting said wire harness to articles of electrical equipment of the automobile, said apparatus comprising:

a carrier panel adapted to be attached to a car body having wire harness means installed therein;

said wire harness fixed to said carrier panel and having a main portion and branch portions at respective ends of which a plurality of connectors are attached, said connectors including a first connector and a second connector, said first connector being fixed and positioned on said carrier panel for connection to said wire harness means of the car body;

means for installing articles of electrical equipment on said carrier panel; and

means for fixing and positioning said second connector on said carrier panel to face a first selected member of said articles of electrical equipment;

wherein said carrier panel has a car body side and a passenger room side, said wire harness being fixed to the carrier panel on the passenger room side thereof.

4,943,242

ZERO INSERTION FORCE HIGH DENSITY CONNECTOR SYSTEM

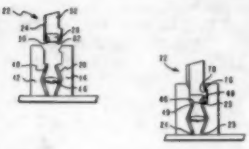
Richard F. Frankesy, Elgin; Javad Haj-all-Ahmadi, Austin; Ronald L. Imken, Round Rock, and Rolf Wustrau, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1989, Ser. No. 347,694
Int. Cl.[5] H01R *23/70*
U.S. Cl. 439—65 **24 Claims**

1. An electrical connector system for interconnecting a circuit package to a card comprising

a buckling beam strip means carrying a plurality of buckling beams for electrically connecting each of a plurality of first contacts on said package to a corresponding one of a plurality of second contacts on said card; and

a housing means retaining said buckling beam strip means for alternately establishing pre-buckling of said buckling beam strip means and release of said pre-buckling of said buckling beam strip means.

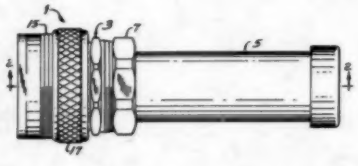


4,943,243

WIRE CONNECTOR

Arthur I. Appleton, 22 Indian Creek Island, Miami Beach, Fla. 33154

Filed Oct. 21, 1988, Ser. No. 260,688
Int. Cl.[5] H01R *13/52*
U.S. Cl. 439—289 **7 Claims**



1. A connector for coupling multiple electrical terminals to one another, comprising:

(a) a first housing supporting a first terminal support consisting of a resilient material including portions defining a plurality of apertures;

(b) a second housing supporting a second terminal support consisting of a resilient material including portions defining a plurality of apertures.

(c) a first and second plurality of terminals being removably located in said apertures of said first and second terminal supports, respectively, said terminals having abutment means formed thereon such that said terminals can be removed from said apertures in a first direction but are prevented from being removed from said apertures in a second direction;

(d) means for securing said first housing to said second housing such that said first plurality of terminals contacts said second plurality of terminals to apply pressure to said terminals in said second direction to thereby compress the resilient material of said first and second terminal supports whereby a pressure connection is created between said first and second plurality of terminals.

4,943,244

GROUNDING ELECTRICAL CONNECTOR

Yap Y. Teck; Lim T. Wah; Anna T. K. Geok, and Chan H. Weng, all of Singapore, Singapore, assignors to Molex Incorporated, Lisle, Ill.

Filed Dec. 26, 1989, Ser. No. 456,765
Int. Cl.[5] H01R *13/73*
U.S. Cl. 439—567 **19 Claims**

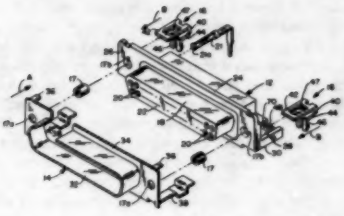
1. An electrical connector for mounting to a substrate such as a printed circuit board, comprising:

an insulative housing defining a front face, a rear portion and a base portion which is mountable to the printed circuit board;

a conductive shield positionable against the front face of the

housing and including a ground strap extending rearwardly beneath the base portion of the housing; and

a conductive board lock member positionable against the rear portion of the housing and including a commoning portion extending forwardly beneath the base portion of



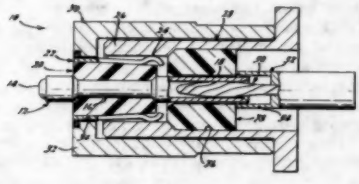
the housing in engagement with the ground strap of the conductive shield, the board lock member including leg means positionable through a locking hole in the printed circuit board and for commoning the conductive shield to a ground trace on the printed circuit board adjacent the hole.

4,943,245

COAXIAL ELECTRICAL CONNECTOR

Thomas C. Lincoln, South Pasadena, Calif., assignor to Microdot Inc., Chicago, Ill.

Filed Jul. 31, 1989, Ser. No. 386,694
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—578 2 Claims



1. A matched impedance pin connector comprising

a tubular female contact having an open end,

a male contact acceptable in the open end of said female contact,

a male contact sleeve surrounding one end of said male contact in radially spaced relation to and electrically connected thereto,

a male contact housing disposed about said male contact sleeve in radially spaced co-axial relation thereto,

a first annular insulator disposed interiorly of said male contact housing in axially aligned relation to said male contact sleeve, said first annular insulator and male contact sleeve having substantially equal inside diameters for the telescopic acceptance of said female contact,

a female contact housing disposed about said female contact in radially spaced coaxial relation thereto and having an inside diameter substantially equal to the outside diameter of said male contact sleeve for the acceptance thereof in telescopic relationship, and

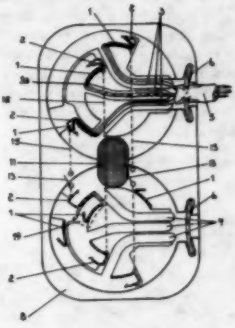
a second annular insulator interposed between said female contact and said female contact housing to maintain a constant radial spacing therebetween.

4,943,246

ELECTRICAL CONNECTOR FOR WIRE CONNECTION

Hugh H. Gilbert, 19 Thrifts Walk, High Street Chesterton, Cambridge, United Kingdom

Continuation of Ser. No. 151,477, Feb. 2, 1988, abandoned. This application Sep. 7, 1989, Ser. No. 369,727
Claims priority, application United Kingdom, Feb. 3, 1987, 8702409
Int. Cl.[5] H01R *11/09*
U.S. Cl. 439—656 13 Claims



3. An electrical connector which includes a two part body having one part turnable about a turning axis relative to the other part and in which an end of a length of insulation covered flexible wire is bared of insulation and brought into electrical connection with an electrically conducting terminal means in the body, said connector comprising a two component wire trap having a convex member and a concave member having one wall and a base, one of said members being supported by one part of the body and being electrically connected to said terminal means, one of the members being mounted on one body part to move along an arcuate path about the turning axis relative to the other member mounted on the other body part, whereby the wire trap can be moved between an open position in which said members are spaced apart from each other to a closed position in which the convex member is located in the concave member, a wire passage in the body which has an open end disposed between the members in the open position of the trap, whereby the bared end of said length of wire passed along said passage protrudes from said open end across said path and is bent into said path to be trapped between the said members and thus be placed in electrical connection with said one member as the concave member surrounds the convex member in the closed position of the trap, the wire thereby being bent to lie along said one wall and at least extend toward the base of the concave member.

4,943,247

ANNULAR ELECTRICAL TERMINAL

James H. Wise, Palmyra, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 31, 1989, Ser. No. 359,188
Int. Cl.[5] H01R *11/11*
U.S. Cl. 439—883 15 Claims

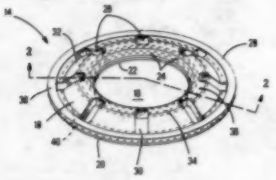
1. An improved electrical terminal suitable for use in connecting a first electrical article to a second electrical article comprising:

an annular member having opposed first and second major surfaces, said first and second major surfaces associated respectively with said first and second electrical articles for electrically interconnecting respective conductive surfaces of said first and second electrical articles;

said annular member having a centrally disposed fastener receiving aperture extending therethrough from said first

major surface to said second major surface, said annular member having an inner edge adjacent said fastener receiving aperture and an outer edge extending circumferentially therearound;

said annular member further including a plurality of slots spaced therearound each extending between at least one integral strap section along one of said inner edge and said outer edge, said slots defining therebetween respective spring sections in an annular array, each of said spring sections at least include respective protrusions extending outwardly from one of said first and second major surfaces, each said respective protrusion having a crest portion, all of said respective crest portions being disposed substantially in a common plane and defining an array of first contact surfaces comprising a first contact interface for electrical engagement with said conductive surface of said first electrical article upon being fastened thereto by fastening means; and



the other of said first and second major surfaces at least including an array of surface portions disposed substantially in a common plane and defining an array of second contact surfaces comprising a second contact interface for electrical engagement with said conductive surface of said second electrical article, said first and second electrical articles being secured together and biasedly held against said respective connecting portions by said fastening means, thereby compressing said spring sections and establishing contact normal force between said first electrical article and said first contact surfaces and said second electrical article and said second contact surfaces; whereby

a plurality of electrical paths in parallel are generated between said first electrical article and said second electrical article upon said terminal being connected between said first and second electrical articles thereby minimizing the electrical resistance at the contact interfaces.

4,943,248

ELECTRICAL TERMINAL FOR BLADED FUSE

Stephen A. Colleran, Lisle; Robert J. Gugelmeyer, Aurora, and Bill B. Wilson, Montgomery, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Continuation of Ser. No. 213,193, Jun. 29, 1988, abandoned. This application Sep. 25, 1989, Ser. No. 411,254

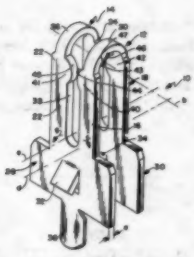
Int. Cl.[5] H01R *11/22*

U.S. Cl. 439—850 **5 Claims**

1. An electrical connector for connecting an automotive fuse to another circuit member, said automotive fuse being of the type including an elongate dielectric fuse housing having a body portion with an edge and a pair of coplanarly aligned, spaced-apart, flat metallic contact blades extending from said edge, said electrical connector comprising:

a dielectric connector housing including a front end with at least one elongate opening and an opposed rear end with at least one pair of spaced and aligned openings, a fuse-receiving slot extending rearwardly from said elongate opening in the front end to a rear slot surface disposed intermediate the front end and the rear end of the housing, and at least one pair of spaced-apart terminal receiving cavities extending forwardly from said pair of rear end openings to said rear slot surface and communicating with said fuse-receiving slot; and

at least one pair of terminals stamped and formed from a unitary metal strip having a substantially uniform thickness, each terminal including first and second spaced apart bases and a pair of adjacent spaced apart U-shaped contact structures extending between and interconnecting the first and second bases and defining a blade-receiving contact slot therebetween, each said U-shaped contact structure including a first contact arm extending from said first base and a second contact arm extending from said second base and a connecting strip extending therebetween, said first contact arms and said second contact arms each being spaced apart a distance substantially larger than said strip thickness and having a generally convex arcuate contact edge portion extending into said blade-receiving contact slot such that the distance between opposing arcuate edge portions of said U-shaped contact structures is less than



the thickness of a said flat contact blade of an automotive fuse, each terminal being mounted in one of said terminal-receiving cavities so that the blade-receiving contact slot is aligned with the fuse-receiving slot and the bases are disposed adjacent the rear end of the housing, each terminal further including a second contact portion extending from one of said bases for electrically engaging said another circuit member,

whereby, insertion of an automotive fuse into said fuse-receiving slot so that the edge of the fuse housing generally abuts said rear slot surface and the flat blade contact portions are received in the blade receiving contact slots of the terminals causes the U-shaped contact structures of each terminal to be deflected away from one another generating four vibration-resistant points of electrical contact between each terminal and each fuse blade to securely, electrically and mechanically engage the automotive fuse in said connector.

4,943,249

LINE CUTTER FOR PROPELLERS

Donald T. Govan, Box 350246, Fort Lauderdale, Fla. 33335

Filed Aug. 11, 1989, Ser. No. 392,542

Int. Cl.[5] B63H *5/16*

U.S. Cl. 440—73 **35 Claims**

21. An apparatus that cuts foreign matter including lines, wires, nets and weeds of the type that may be encountered by propeller driven vessels when under way, said vessels of the type where the propeller is mounted to a rotatable propeller shaft that extends from a propeller shaft housing connected to the vessel's hull, said apparatus comprising:

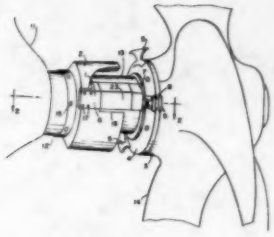
(A) at least one first blade means having a first shearing plane, said first blade means arranged to rotate in conjunction with said propeller with said first shearing plane substantially perpendicular to the axis of said shaft;

(B) first support means for supporting said first blade means in position extending radially and beyond said first sup-

port means to engage said foreign matter, said first support means including means for fixedly attaching to at least one member of the pair consisting of said shaft and said propeller;

(C) at least one second blade means having a second shearing plane, said second blade means arranged with said second shearing plane substantially parallel to said first shearing plane of said first blade means;

(D) second support means for supporting said second blade means in a position extending radially parallel to said first blade means to engage said foreign matter for shearing said foreign matter between said first and second blade



means, said second support means for fixedly attaching to a non-rotating member of said hull;

(E) moving means incorporated in said second support means for moving said second blade means toward and away from said first blade means to maintain said first and second shearing planes in close proximity for shearing operation; and

(F) control means operatively connected to said moving means, said control means including sensing means for sensing the distance between said first and second shearing planes, said control means controlling said moving means to maintain a particular spacing between said shearing planes despite axial movement of said propeller.

4,943,250

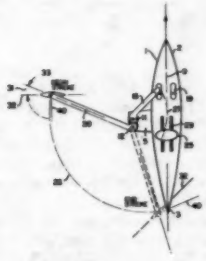
ARTICULATED HYDROFOIL OAR

Stephen DuPont, 24 N. Casey Key Rd., Osprey, Fla. 34229

Continuation-in-part of Ser. No. 252,651, Sep. 30, 1988, Pat. No. 4,867,718, which is a continuation-in-part of Ser. No. 10,585, Feb. 3, 1987, Pat. No. 4,770,821. This application Jun. 19, 1989, Ser. No. 367,778

Int. Cl.[5] B63B *16/04*

U.S. Cl. 440—101 **22 Claims**



1. A rowing apparatus comprising, in combination: a boat having a hull with fore and aft ends and having an outrigger projecting laterally outwards from each side of said hull, and at least two oar assemblies located one on each side of said hull, each of said oar assemblies comprising a handle loom having a generally athwartship position at mid-stroke and having an inboard end and an outboard end located at said outrigger, a blade loom extending outwardly from said outrigger and having an outer end and an inner end also located at said outrigger, an oarlock teeter hinge member mounted onto said outrigger and adapted to rotate about a substantially horizontal axis, a first sweep hinge member affixed to said outboard end of said handle loom, a second sweep hinge member affixed to said inner end of said blade loom, means for rotatably mounting said first and said second sweep hinge members onto said oarlock teeter hinge member, means associated with said first and second teeter hinge members for transferring the motion of said handle loom to said blade loom while at the same time reversing the direction thereof, and a blade having a hydrofoil shaped surface mounted to and below said outer end of said blade loom, said blade lying in a generally vertical plane and defining with said blade loom an angle of incidence therebetween, the arrangement being such that when said handle loom is rotated during the thrust stroke, said blade moves in a sweep arc through the water floating said hull in a direction opposite to the motion of said handle loom, said blade traveling in a substantially lateral direction with respect to said hull over a portion of said sweep arc, the angle of incidence between said blade and said blade loom being such that said blade acts as a laminar flow, unstalled hydrofoil having an angle of attack with respect to its movement through the water which will produce a thrust generally normal to the direction of motion of said hydrofoil surface during said lateral moving portion of said sweep arc.

4,943,251

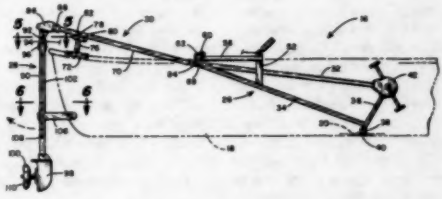
PEDAL OPERATED OUTBOARD MOTOR FOR WATERCRAFT

Thomas E. Lersch, Shoreview, Minn., and Abraham Meron, Hudson, Wis., assignors to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Aug. 2, 1989, Ser. No. 388,610

Int. Cl.[5] B63H *16/14*

U.S. Cl. 440—28 **18 Claims**



1. A pedal operated apparatus for propelling watercraft, comprising:

a main drive assembly including a main frame means removably fixed to a watercraft, a pedal and crank assembly supported rotatably on the main frame means near a forward end portion thereof, and a main drive means drivably engaged with said pedal and crank assembly and extended along said main frame means to a rearward end portion of the main frame means;

a propeller mounting assembly including an elongate and generally vertically disposed propeller carrying frame member outside of the watercraft and having upper and lower end regions respectively above and below the water level when the watercraft is afloat, a propeller mounted rotatably relative to said lower end region, and a propeller drive means extended along said propeller carrying frame member from the upper end region to the lower end region and drivably engaged with said propeller;

an intermediate coupling means for supporting said propeller assembly and for drivably engaging said main drive means and said propeller drive means; and

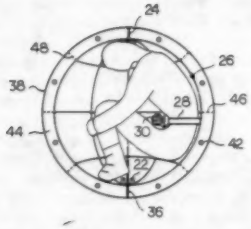
a force transmitting member mounted to the propeller carrying frame member medially between said end regions and positioned to engage the watercraft at a predetermined exterior surface location to transmit the thrust of said propeller from the propeller carrying frame member to the watercraft at said predetermined location.

4,943,252

AVALANCHE FLOTATION BALL

Thomas J. Manix, 4021 Marquis Way, Anchorage, Ak. 99502

Filed Jun. 9, 1988, Ser. No. 204,271
Int. Cl.[5] B63C *9/06*
U.S. Cl. 441—87 **4 Claims**



1. In survival equipment, a protective and buoyant device which is worn around the waist in a belt pack, in its uninflated condition, the belt pack having a detachably attached belt means and a cover means to hold ready the device prior to deployment, and which comprises a plurality of concentric spheres having a plurality of exit enclosure means, said concentric spheres including inner and outer sphere walls of flexibly impervious materials defining an inflatable and airtight space therebetween, partitioning means in said space limiting the separation of the inner sphere and outer sphere walls, said concentric spheres being so constructed and arranged to totally enclose and isolate an occupant upon inflation of the device from any environment outside the device, said belt means being fixedly attached to the inner sphere wall and also being removably connected to the user for securing his position relative to the spheres upon any acceleration or deceleration of the device, and pressure means operatively connected to said spheres for introducing a gas into said space under a pressure substantially in excess of ambient pressure whereby said spheres are forcefully expanded to a generally spherical configuration, said pressure also tending to maintain the generally spherical configuration against any deforming forces, whereby the user of the device is cushioned and protected while remaining buoyant.

4,943,253

AXIAL IMMOBILE FASTENER-RECEIVING MEMBER

Jon D. Smith, Fenton, Mich., assignor to Dry Dock Industries, Inc., Fenton, Mich.

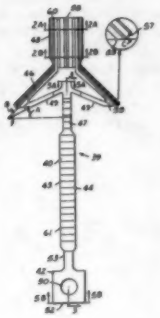
Filed Mar. 23, 1989, Ser. No. 327,781
Int. Cl.[5] F16B *21/18*
U.S. Cl. 411—342 **13 Claims**

1. A fastener-receiving member adapted to be disposed in a hole and to receive a fastener member, comprising:

a nut section formed with a central aperture sized to receive a fastener member, said nut section being located at a first axial end of said receiving member;

a locking section extending from said nut section and configured to secure the fastener-receiving member in a hole; and

an extension section formed of two separate elongate opposed members that are integrally connected at a second axial end of said fastener-receiving member by an intermediate member, said intermediate member being axially immobile with respect to said opposed members, said extension section extending from said locking section and having a central aperture for passage of the fastener member, said extension section being formed such that it can be



removed accurately at a desired incremented axial position.

4,943,254

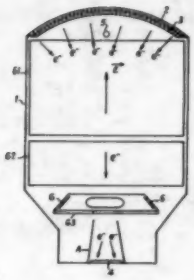
METHOD FOR THE FABRICATION OF AN IMPROVED X-RAY IMAGE INTENSIFIER TUBE, AND INTENSIFIER TUBE, AND INTENSIFIER TUBE OBTAINED THEREBY

Gérard Vieux, Grenoble; Francis Díaz, Moirans, and Paul de Groot, St-ismier, all of France, assignors to Thomson-CSF, Puteaux, France

Filed Jul. 6, 1989, Ser. No. 375,997
Claims priority, application France, Jul. 8, 1988, 88 09310
Int. Cl.[5] H01J *9/20*; G21K *4/00*
U.S. Cl. 445—28 **7 Claims**

1. A method for the fabrication of an improved X-ray image intensifier tube with, notably, a photocathode comprising an alkaline antimonide, several electrodes and an anode, wherein, prior to the fabrication of the cathode by means of a vapor deposition of antimony and alkaline metals, there is deposited, before introducing it into the tube, on at least a part of the electrode which is closest to the anode, a layer of a conductive

material having the property of reacting with the above mentioned alkaline metals, said conductive material being chosen



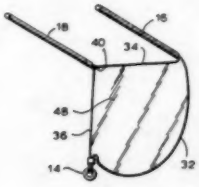
from the group consisting of electrically conductive organic polymers.

4,943,255

BUBBLE MAKING TOY WITH TWO WANDS AND A WICK COMPRISING THREE SEGMENTS

Kalvin K. Klundt, Lagrange, Ky., assignor to The Big Time Toy Co., Louisville, Ky.

Filed Dec. 2, 1987, Ser. No. 127,653
Int. Cl.[5] A63H *33/28*
U.S. Cl. 446—15 32 Claims



1. An apparatus for forming and controlling bubbles formed from a bubble solution, comprising:

(A) an operatively continuous wick means for storing and releasing quantities of a bubble solution, said wick means including in series a first elongate segment, a second elongate segment and a third elongate segment, said first and third segments defining a point therebetween, and said first segment being substantially equal in length to said second and third segments combined;

(B) a control wand and a support wand for moving said wick means between a bubble-initiating position and a bubble-developing position, said control wand being fixedly secured during use to said wick means between said second and third segments, and said support wand being fixedly secured during use to said wick means between said first and second segments; and

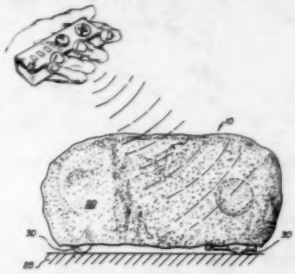
(C) means fixedly secured to said point between said first and third segments of said wick means for causing adjacent ends of said first and third segments at said point to be substantially flush against each other when in the bubble-initiating position to prevent a gap therebetween.

4,943,256

AMUSEMENT DEVICE PROPELLED BY AN ECCENTRIC APPARATUS

Robert W. Symons, Incline Village, Nev., assignor to PN International Corp., Mt. Kisco, N.Y.

Filed Jan. 11, 1988, Ser. No. 142,817
Int. Cl.[5] A63H *11/12, 17/25, 30/04, 17/00*
U.S. Cl. 446—278 12 Claims



1. An amusement device, comprising:

a base frame having a first end and a second end;

at least one ratchet wheel assembly mounted to and supporting said second end of said base frame;

a prime mover mounted within said base frame;

a cam rotatably driven by said prime mover;

a yoke assembly having a first yoke and a second yoke, said second yoke activated by said cam to cause said first yoke to move in a scissor like motion relative to said second yoke and said first end of said base frame;

an elastic covering looking like a rock fixed to said base frame and said first yoke substantially covering from view said yoke assembly and said prime mover and being elastic enough to flex with said yoke assembly; and

at least one ratchet wheel assembly mounted at said first yoke such that when said first yoke moves toward said second yoke, said ratchet wheel at said first yoke rotates while said ratchet wheel at said base is prevented from rotating and when said first yoke moves away from said second yoke said yoke ratchet wheel is prevented from rotating while said base ratchet wheel rotates resulting in movement of the device along a supporting surface.

4,943,257

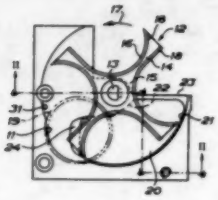
COIN SORTING DEVICE WITH ANTICRAMPING MEANS

Bengt G. Nilsson, Oxie, and Bengt G. Lindahl, Lund, both of Sweden, assignors to Scan Coin AB, Malmo, Sweden

PCT No. PCT/SE87/00102, § 371 Date Sep. 9, 1988, § 102(e) Date Sep. 9, 1988, PCT Pub. No. WO87/05729, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 4, 1987, Ser. No. 246,299
Claims priority, application Sweden, Nov. 3, 1986, 8601117
Int. Cl.[5] G07D *1/00*
U.S. Cl. 453—9 3 Claims

1. Coin assorting device comprising a disc mounted for rotation on a bottom plate, having a normal rotational direction and rotating below a coin supply tube for coins stacked therein, said disc having four wings separated by four recesses for receiving a coin from said coin supply tube in each recess, said bottom plate having a discharge opening for coins, the diameter of which is less than a predetermined maximum diameter of the coins supplied, characterized in that the discharge opening in the bottom plate is located beneath said coin supply

tube, and that the wings of the rotatable disc on the side thereof facing the normal rotational direction forms a blunt edge,



having a thickness which essentially corresponds to the thickness of the thinnest occurring coin.

4,943,258

OUTLET DEVICE FOR COIN PAYOUT HOPPERS

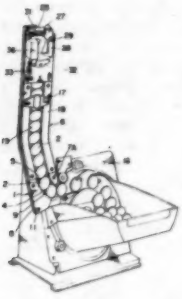
Hiroshi Abe, Tokyo, Japan, assignor to Asahi Seiko Kabushiki Kaisha, Japan

Filed Sep. 28, 1988, Ser. No. 250,092

Claims priority, application Japan, Oct. 3, 1987, 62-151784[U]

Int. Cl.[5] G07D 9/04

U.S. Cl. 453—30 5 Claims



1. An outlet device for coin payout hoppers comprising: an outlet chute having a curved coin guiding passage for upwardly guiding coins pushed in a lower inlet in the horizontal direction towards an upper outlet and an escalator connected to the upper outlet of the outlet chute comprising front and back side plates and a pair of edge plates interposed between side edges of the side plates to define a coin guiding passage upwardly extending from the upper outlet of the curved guiding passage of the outlet chute, said escalator comprising means for holding coins including a ball retaining gutter having a sloped guide wall extending along the coin guiding passage at an acute angle such as 8°–15° with respect to the front side plate and a coin holding ball which is vertically movable in the ball retaining gutter and protrudes from an opening in the front side plate into the coin guiding passage so as to contact a side surface of the coin in the coin guiding passage, to thereby hold the coin by a wedging action of the ball moved downwardly in the sloped guide gutter when the coin tends to descend in the coin guiding passage.

4,943,259

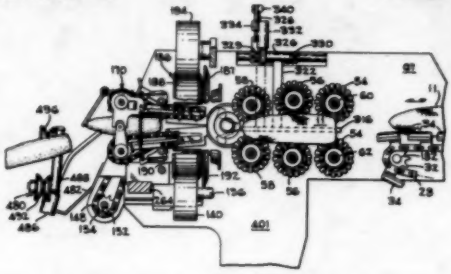
CORN CUTTER AND SYSTEM

Eugene F. Felstehausen, Hoopeston, Ill., assignor to FMC Corporation, Chicago, Ill.

Filed Jul. 21, 1988, Ser. No. 222,458

Int. Cl.[5] A01F 11/06

U.S. Cl. 460—52 3 Claims



1. A corn cutter unit comprising:
a rotating head;
a plurality of knives arranged on said head;
a plurality of feed rollers for propelling ears of corn toward said knives; and
a cob puller having upper and lower chains formed of links; a sprocket for driving each chain and a guide for each chain having a height substantially equal to the length of said individual links.

4,943,260

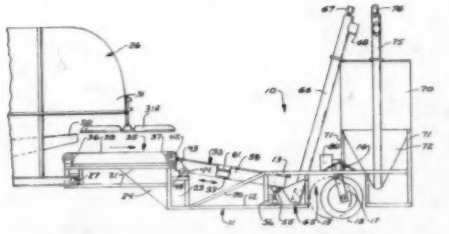
WEED SEED HARVESTER

Arthur J. Fossum, 1034 N. 15th St., Fargo, N. Dak. 58102

Filed Oct. 5, 1988, Ser. No. 253,848

Int. Cl.[5] A01F 12/44; B07B 1/30

U.S. Cl. 460—96 11 Claims

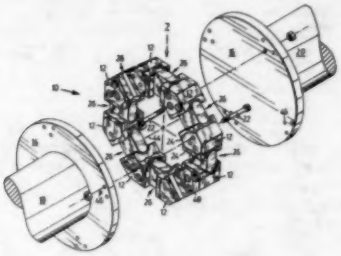


8. Apparatus for collecting weed seeds from the discharge end of a grain combine that has a discharge of chaff at a rear end thereof, comprising:
a frame;
means to mount said frame for movement along the ground;
means at a forward portion of said frame for attaching it to be towed by a combine in position below rear portions of such combine;
means for receiving material from selected discharge points of such combine including a generally horizontal conveyor for receiving discharged chaff and conveying it rearwardly, and a shaker screening member that separates the chaff from small seed and particles positioned rearwardly of the conveyor for receiving material from the rear of the conveyor;
means to collect said small seed and particles from the shaker screening member and convey them to a storage container; and
means for permitting discharge of chaff collected back onto the ground.

4,943,261
FLEXIBLE SHAFT COUPLING HAVING FLEXIBLE ELEMENTS INTERSPERSED BETWEEN ALTERNATING ATTACHMENT WEDGES

Roy E. Smith, Kingston, Canada, assignor to UTDC Inc., Kingston, Canada

Filed May 12, 1989, Ser. No. 350,805
Int. Cl.[5] F16D *3/78*
U.S. Cl. 464—76 10 Claims



1. A flexible drive coupling for transmitting rotational forces between a driving shaft and a driven shaft, said driving and driven shafts having respective attachment means for attachment of said coupling thereto, said flexible drive coupling comprising:

a plurality of wedges for alternating attachment to said attachment means of said driving and driven shafts, each said wedge having end faces;

a plurality of flexible elements interspersed between respective end faces of adjacent wedges, said flexible elements having:

a link having two curved end surfaces;

two end plates, each end plate having respective inner and outer surfaces, said inner surfaces being shaped so as to co-operate with a respective one of said curved end surfaces of said link;

al elastomeric filler between each of said inner surfaces of said end plates and said curved end surfaces of said link so that each end plate may pivot with respect to said link by deforming said elastomeric filler; and

said outer surfaces of said end plates and said end faces of said wedges have co-operating tabs and recesses to prevent relative radial and axial movement.

4,943,262
BEARING ASSEMBLY FOR THE CROSS MEMBER OF A UNIVERSAL JOINT

Jürgen Schultze, Essen, Fed. Rep. of Germany, assignor to GKN Cardantec International Gesellschaft für Antriebstechnik mbH, Essen, Fed. Rep. of Germany

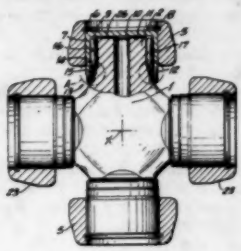
Filed Feb. 28, 1989, Ser. No. 316,868
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1988, 3806397
Int. Cl.[5] F16D *3/41*
U.S. Cl. 464—131 5 Claims

1. A bearing assembly for supporting arms of a cross member of a universal joint in associated joint yokes, comprising:

axially fixed bearing bushes received in bores of the yokes and in each of which an arm is received with rolling members arranged therebetween, end faces of the arms being supported relative to a base of the bearing bushes, the bearing bush having an annular space towards an open end thereof;

a seal for sealing the annular space between the inner wall of the bearing bush and the outer face of the arm; and

a supporting disc provided so as to hold the rolling members, the supporting disc having a bore and being supported on a step of an associated arm of the cross member in the direction of its axis of rotation, and in a region adjoining the supporting disc, in the direction of the open end of the bearing bush, the seal is inserted into the annular space and

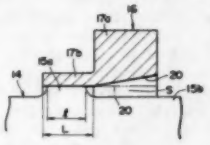


firmly seated, the step having a face conically increasing towards the open end of the bearing bush, and the supporting disc having a corresponding conical bore.

4,943,263
STRUCTURE FOR MOUNTING DAMPER ON ROTARY SHAFT

Masakazu Zyogahara; Shinichi Yokoyama, and Hisashi Yamanaka, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Mar. 23, 1989, Ser. No. 327,527
Claims priority, application Japan, Apr. 18, 1988, 63-51970[U]
Int. Cl.[5] F16F *15/10*
U.S. Cl. 464—180 10 Claims



1. A damper for mounting on a rotary shaft, the damper consisting of a plurality of damper pieces capable of being disposed in circumferentially adjacent relation around the rotary shaft and a plurality of connecting means for connecting circumferentially adjacent damper pieces with each other on said rotary shaft, wherein

each of said damper pieces consists of a single piece of homogeneous material and is formed to have a mass portion that is out of contact with said rotary shaft and a mounting portion having rigidity less than that of the mass portion and in contact with said rotary shaft when the damper is mounted on the shaft.

4,943,264
CENTRIFUGAL CLUTCH WITH BELT TIGHTENING SPACER ASSEMBLY

Marvin E. Whiteman, Jr., 2254 Braniff St., Boise, Id. 83706

Continuation-in-part of Ser. No. 371,100, Jun. 26, 1989. This application Nov. 2, 1989, Ser. No. 430,256
Int. Cl.[5] F16H *11/06*
U.S. Cl. 474—13 12 Claims

1. A variable speed centrifugal clutch with belt tightening assembly for transmitting power equally to at least a pair of belts, comprising:

(a) a spindle driven for rotation about a longitudinal axis, said spindle including a hollow cylindrical portion having

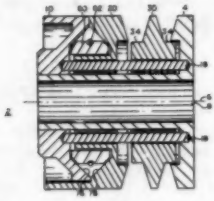
an axis corresponding with said longitudinal axis and an annular flange portion extending outwardly from one end of said cylindrical portion;

(b) a clutch plate connected with the other end of said spindle cylindrical portion for rotation therewith;

(c) means mounted on said spindle between said spindle flange portion and said clutch plate for transmitting rotational drive forces from said spindle to at least a pair of belts, said belt drive transmission means including:

(1) a clutch drum having a central longitudinal axis coinciding with the spindle longitudinal axis slidably mounted upon said spindle cylindrical portion for longitudinal displacement along said spindle cylindrical portion, said clutch drum further having a slide rail hole formed therethrough at a location displaced from but parallel to the clutch drum longitudinal axis for slidably receiving a slide rail;

(2) spacer means having a central longitudinal axis coinciding with the spindle longitudinal axis slidably



mounted upon said spindle cylindrical portion between the clutch drum and the spindle annular flange portion for longitudinal displacement along said spindle cylindrical portion, said spacer means further having one slide rail hole formed therethrough at a location in alignment with the slide rail hole of the clutch drum for slidably receiving a slide rail;

(3) a slide rail slidably inserted through the slide rail holes of the clutch drum and spacer means and connected at its ends to the clutch plate and the spindle annular flange so as to rotationally interlock the clutch plate, clutch drum, spacer means and spindle and allow for longitudinal displacement of the clutch drum and spacer means along the spindle cylindrical portion; and

(4) centrifugal force displacing means for displacing said clutch drum in the longitudinal direction toward said spacer means and said spindle flange portion to compress said spacer means evenly against the belts, whereby the rotation of said spindle is evenly transmitted to the belts to drive the belts at equal speeds.

4,943,265

DEVICE FOR TRANSMITTING AN ADJUSTABLE POSITION OF A DRIVEBELT PULLEY IN A CONTINUALLY VARIABLE TRANSMISSION

Holm Schmitt, Cologne; Fritz Henken, Langwedel; Hartmut Röper, Monheim, and Peter Heider, Euskirchen, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 17, 1989, Ser. No. 380,420

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1988, 3827543

Int. Cl.[5] F16H *9/00*

U.S. Cl. 474—25 **7 Claims**

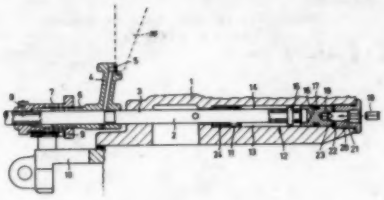
1. A device for adjusting the position of a system that transmits the position of a displaceable pulley located in an automatic transmission to a control element, comprising:

a control lever;

a guide rod supported for displacement along its axis and rotation about its axis;

a sensor supported on the guide rod for axial displacement, located for contact with the pulley;

a bushing having an surface adapted for contact with the control lever, connected to the guide rod for axial dis-



placement and rotation therewith, engaged with the sensor so that the position of the sensor changes as the guide rod rotates;

means for rotating the guide rod.

4,943,266

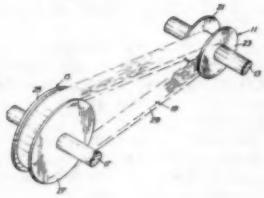
METAL CHAIN BELT

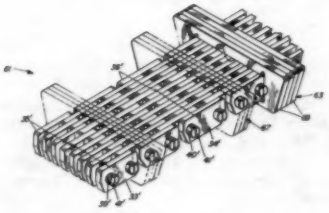
Philip J. Mott, Des Plaines, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 676,143, Nov. 29, 1984, abandoned. This application Mar. 20, 1989, Ser. No. 326,464

Int. Cl.[5] F16G *5/18*

U.S. Cl. 474—201 **12 Claims**





1. An endless power transmission chain-belt comprising:

a carrier comprising a plurality of sets of links; each link defining a pair of spaced-apart pivot centers, the distance between adjacent pivot centers defining the pitch of a link, which links are arranged in sets, some sets of links having a first pitch and other sets of links having a second pitch longer than the first pitch;

means joining adjacent sets of links and permitting articulation of said carrier about said pivot centers; and,

a plurality of generally trapezoidal blocks, said blocks being secured transversely across the sets of links of said second pitch and said blocks being secured transversely across less than all of the sets of links of said first pitch.

4,943,267

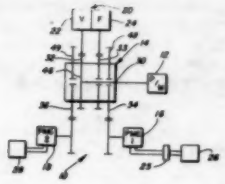
MECHANICAL DIFFERENTIAL

Kenneth B. Sugden, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 7, 1988, Ser. No. 280,955

Int. Cl.[5] F16H *37/06*

U.S. Cl. 475—6 **23 Claims**



1. A mechanical differential comprising:

first, second and third ring gears, each having inner and outer surfaces;

first and second planet gears rotatably disposed on first and second carrier rods, the first and second planet gears and said first and second carrier rods being disposed within said ring gears, said first and second planet gears being engaged with said inner surface of said first ring gear; and

two sets of planet gears, each of said sets including third and fourth planet gears, one of said sets being rotatably disposed on a third carrier rod and the other of said sets being rotatably disposed on a fourth carrier rod, said two sets of third and fourth planet gears being engaged respectively with said first and second planet gears, said two third planet gears being further engaged with said inner surface of said second ring gear and said two fourth planet gears being further engaged with said inner surface of said third ring gear.

4,943,268

AUTOMATIC TWO-SPEED TRANSMISSION FOR THE DRIVE OF AUXILIARY UNITS OF A MOTOR VEHICLE ENGINE

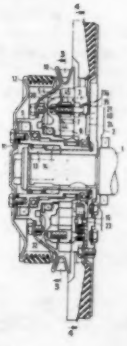
Siegfried A. Eisenmann, and Hermann Härle, both of Conchesstr. 23, D-7960 Aulendorf, Fed. Rep. of Germany

Filed Jun. 15, 1989, Ser. No. 366,791

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1988, 3822611

Int. Cl.[5] F16H *57/10*

U.S. Cl. 475—95 **26 Claims**



1. An automatic two-speed transmission for the drive of at least one auxiliary unit (dynamo, fan, etc.) of a motor vehicle internal-combustion engine by the latter comprising a gear set in which at least one gear of which the axis of rotation orbits about the axis of rotation of another gear concentric with the input shaft of the transmission is in engagement with said other gear, a control element which is formed as freewheel, and a further control element rotating with an input shaft and actuable by centrifugal force for retarding and releasing the relative rotation between the gears of the gear set,

wherein

the transmission comprises a housing revolving concentrically to the input shaft and containing a fluid supply, at least two gears of the gear set cooperate in the manner of a hydrostatic pump and can be influenced with the fluid,

and the centrifugal control element also revolving with the housing controls the influencing of the pump.

4,943,269

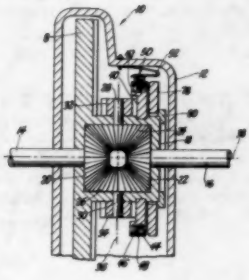
DIFFERENTIAL WITH LOCK-OUT MECHANISM

Roger R. Smith, 7261 Lyons Rd., Imlay City, Mich. 48444

Filed May 26, 1989, Ser. No. 358,735

Int. Cl.[5] F16H *1/38, 1/44, 1/445*

U.S. Cl. 475—231 **6 Claims**



1. A differential receiving rotary mechanical power from an input shaft and transmitting the rotary mechanical power to a pair of output shafts, the differential having a lock-out mechanism for compelling the output shafts to rotate at the same speed, the differential comprising:

a housing in which the input shaft and output shafts are journalled; the output shafts having a common axis;

a gear case rotatable in the housing on the common axis;

a transfer gear rotating the gear case in response to rotation of the input shaft;

an opposed gear coaxially fixed to each output shaft;

at least one orbital gear inside the case meshed with both of the opposed gears, whereby relative rotation between the opposed gears compels rotation of the orbital gear;

a pinion gear external to the gear case, the pinion gear rotating in concert with the orbital gear;

an annular gear member concentrically and rotatably mounted to the exterior of the gear case, the annular gear member having teeth on one axial side for meshing engagement with the pinion gear, whereby relative rotation between the opposed gears results in rotation of the annular gear member relative to the gear case;

a clutch mechanism surrounding the gear case at a position axially adjacent the annular gear member, the clutch mechanism having a clutch plate member rotationally fixed relative to the housing and axially translatable on the case along a path parallel to the common axis so that the clutch plate member can be frictionally engaged or disengaged from the annular gear member;

wherein the clutch mechanism further comprises a plurality of brackets disposed about an outer peripheral zone of the clutch plate member, each bracket having a first arm extending radially inwardly along one side of the outer peripheral zone of the clutch plate member and a second

arm extending radially inwardly along an opposite side of the outer peripheral zone of the clutch plate member, the axial distance between the arms being slightly greater than the axial width of the outer peripheral zone of the clutch plate member, a bridge portion of the bracket connecting the arms, the housing having an inner peripheral wall defining arcuate slots, the bridge portion of the brackets each defining a boss projecting into one of the slots, the slots being oblique to a plane passing through the housing perpendicular to the common axis, the brackets sliding along the arcuate slots while travelling in a curved path about the outer peripheral zone of the clutch plate member so that sliding the brackets along the slots results in angular movement of the brackets about the common axis and simultaneously results in translation of the brackets and the clutch plate member along the path parallel to the common axis;

holder means for fixing the positions of the brackets relative to one another;

means for biasing the brackets to a first angular position such that the clutch plate member is disengaged from the annular gear member;

means for moving the brackets to a second angular position such that the clutch plate member engages the annular gear member.

4,943,270

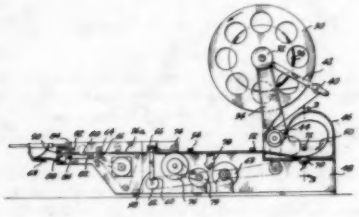
PHOTOGRAPHIC PRINT CUTTER

Allen E. Fleckenstein, Bellevue, Wash., assignor to CX Corporation, Seattle, Wash.

Continuation of Ser. No. 170,677, Mar. 18, 1988, abandoned, which is a continuation of Ser. No. 903,544, Sep. 2, 1986, abandoned. This application Oct. 24, 1989, Ser. No. 426,522

Int. Cl.[5] B26D *5/20*

U.S. Cl. 493—10 **6 Claims**



1. A print cutter for receiving a continuous web of photographic prints and cutting them into individual lengths comprising:

a base;

a track having a curved loop-forming portion mounted on said base, said web engaging said track and said loop-forming portion acting on said web to form said continuous web into a loop;

first drive means associated with said track for engaging said web and driving it in a first direction through said loop-forming portion;

second drive means associated with said track for driving said web in said first direction after it has passed through said loop-forming portion, said second drive means associated with said track operable independently of said first drive means;

cutter means mounted adjacent said track and spaced from said second drive means in said first direction;

a single sensor mounted adjacent said loop-forming portion for both sensing the passage of a leading end of said web through said loop-forming portion, and for detecting when the size of said loop of said web within said loop-forming portion is smaller than a predetermined size, said single sensor producing a stop drive signal when the leading end of the web is sensed to stop the first drive means when an end of said web reaches a first position, and said single sensor producing a start drive signal to start said first drive means when the size of said loop within said loop-forming portion is smaller than the predetermined size; and

control means for controlling said first drive means in response to said stop drive and start drive signals from said single sensor, said control means including a time delay means in communication with said sensor to receive said stop drive signal, and in communciation with said first drive means to stop said first drive means a predetermined time after receiving said stop drive signal.

4,943,271

APPARATUS FOR THE PRODUCTION OF (CIGARETTE) PACKS

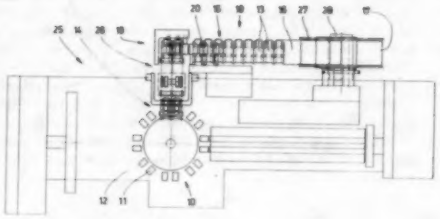
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Oct. 21, 1988, Ser. No. 261,042

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1987, 3735674

Int. Cl.[5] B31B *1/16, 3/32*

U.S. Cl. 493—24 **9 Claims**



1. In a longitudinally elongated apparatus for the production of hinge-lid cigarette packs from a moving continuous web of material, said apparatus having a vertical height and a longitudinally extending front side and a longitudinally extending rear side, severing means (19) for severing individual blanks (13) from the web of material (16), and means including a rotary folding turret (10) for receiving the severed blanks and folding the blanks in the formation of said hinge lid packs, the improvement comprising:

means for guiding the web of material (16) longitudinally along a longitudinal conveying track (18) which is located on the rear side (25) of the apparatus and which is essentially parallel to the longitudinal mid-plane of the apparatus;

said severing means (19) being located on said rear side (25) of said apparatus; and

means for conveying the severed blanks along a plank track (26) transversely relative to the conveying track (18), in a direction from said rear side (25) towards said front side, to said folding turret (10).

4,943,272

APPARATUS FOR MANUFACTURING CIGARETTE FILTER

Ichiro Hirose, Tokyo; Katsuo Kato, and Motonori Inamura, both of Hiratsuka, all of Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Filed Feb. 21, 1989, Ser. No. 312,187

Claims priority, application Japan, Nov. 18, 1987, 62-289538

Int. Cl.[5] A24C *5/28*

U.S. Cl. 493—45 **7 Claims**

1. An apparatus for manufacturing a plurality of cigarette filter plugs by cutting a cigarette filter rod, comprising:

cutting means including:

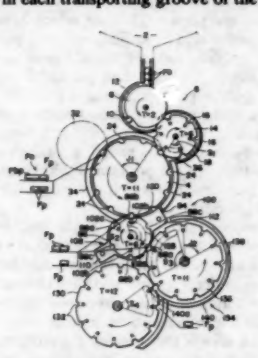
a cutting drum rotatable in one direction, said cutting drum having a plurality of transporting grooves adapted to receive filter rods therein and formed in a circumference of the cutting drum at regular intervals such that axes of the transporting grooves extend in the same direction as an axis of the cutting drum, said cutting drum also having one annular slit formed in the circumference of the cutting drum such that the annular slit extends across the transporting grooves; and

one rotatable circular cutting blade, said cutting blade having a circular edge extending into the annular slit;

filter rod-supplying means for supplying filter rods, each of which is a few times as long as the filter plug, from a supply position, defined with reference to a circumferential direction of the cutting drum, into every n-th transporting groove of the cutting drum (n: a predetermined natural number);

a plurality of stoppers located in the respective transporting grooves of the cutting drum and movable in unison in an axial direction of the transporting grooves;

adjusting means for adjusting the distance between each stopper and the annular slit to a distance corresponding to the length of one filter plug by moving all the stoppers together in the axial direction of the transporting grooves in association with one another, whereby the filter rod received in each transporting groove of the cutting drum



passes the cutting blade with the rotation of the cutting drum, so that the filter rod is cut into one filter plug and a multiple-length plug whose length is an integral multiple of that of the filter plug;

pushing means for pushing either the filter rod received in the transporting groove of the cutting drum or the multiple-length plug obtained by cutting the filter rod against the corresponding stopper along the transporting groove, at least when the filter rod or the multiple-length plug is transported from the supply position to the cutting blade;

receiving means for receiving the filter plug from the transporting groove of the cutting drum, said receiving means including:

a receiving drum which is arranged at a receiving position located away from the supply position in the circumferential direction of the cutting drum and is adapted to be in rolling contact with the cutting drum such that the receiving drum is rotatable in the opposite direction to that of the cutting drum, said receiving drum having a plurality of receiving grooves which are formed in the circumference of the receiving drum at regular intervals and adapted to receive filter plugs and which have axes extending in the same direction as an axis of the receiving drum; and

transfer means for transferring, at the receiving position, one or two filter plugs from the transporting groove of the cutting drum to the receiving groove of the receiving drum and for permitting the multiple-length plug to be held in the transporting groove of the cutting drum, in order for the multiple-length plug to be transported again to the cutting blade with the rotation of the cutting drum,

transport means for transporting either the one or two filter plugs received from the receiving groove of the receiving drum; and

filter plug-juxtaposing means for juxtaposing the filter plugs transported by the transport means, such that their axes are parallel to one another.

4,943,273

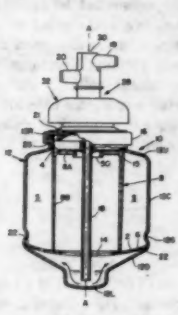
DISPOSABLE CENTRIFUGE BOWL FOR BLOOD PROCESSING

Etienne Pages, Divonne, France, assignor to Haemonetics Corporation, Braintree, Mass.

Continuation-in-part of Ser. No. 232,544, Aug. 15, 1988, which is a continuation of Ser. No. 888,764, Jul. 22, 1986. This application Jan. 5, 1989, Ser. No. 294,056

Int. Cl.[5] B04B 7/00

U.S. Cl. 494—41 **10 Claims**



1. A disposable blood processing centrifuge rotor comprising:

(a) a rotatable bowl body having at least one straight section and upper and lower inclined diagonal sections connected to one of said straight sections; said body being rotatable about an axis and having a single aperture therein concentric with said axis through an outer wall of the bowl body; and

(b) a rotary seal assembly affixed to said bowl body and covering said aperture and having input and output ports for fluid communication with the interior of said bowl body;

(c) a core assembly comprising:

(i) a walled core body having a transverse ring portion which mates with the bowl body at the aperture thereof and a cylindrical portion longitudinally extending from said ring portion; and

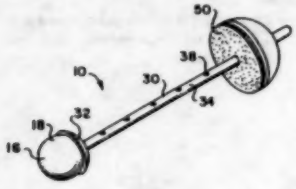
(ii) a diverter member having a donut-like shape with an inner opening coaxial to said axis and a diameter smaller than the outer diameter of said cylindrical portion and an outer apertured periphery with a diameter about equal to the inner diameter of said straight section and larger than the diameter of the bowl aperture and sufficiently non-rigid as to be capable of being inserted through said bowl aperture and be rigidly retained in a horizontal position against an inner wall of the bowl body by compression as the bottom of the cylindrical portion of said core body abuts the diverter member.

4,943,274

APPARATUS FOR APPLYING EARLOBE MEDICATION

Judy S. Edwards, 114 W. 14th St., Irving, Tex. 75060

Filed May 8, 1989, Ser. No. 349,320
Int. Cl.[5] A61M *35/00*
U.S. Cl. 604—2 3 Claims



1. Apparatus for insertion through an aperture in an ear lobe, comprising:

a resilient housing having exterior and interior walls, said interior walls defining a reservoir for medicament, and said housing further having an opening through said exterior and interior walls defining an outlet;

a tubular conduit connected to and extending from said outlet in said housing, said conduit having inner and outer cylindrical longitudinal walls, with a plurality of radial cylindrical walls forming apertures between said inner and outer longitudinal walls;

said housing having a spherical exterior wall; and

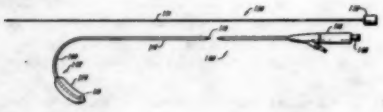
said conduit having a semispherical collar attached to an end thereof and joined to a portion of said housing exterior wall.

4,943,275

INSERTABLE BALLOON WITH CURVED SUPPORT

Saul Stricker, Richmond Hill, Canada, assignor to Abiomed Limited Partnership, Danvers, Mass.

Filed Oct. 14, 1988, Ser. No. 257,752
Int. Cl.[5] A61M *29/00*
U.S. Cl. 600—18 18 Claims



1. An insertable balloon assembly comprising

a balloon having first and second ends,

a balloon supporting structure extending between the first and second ends of the balloon which maintains the balloon longitudinally extended to prevent collapse of the balloon, and imparting a curvature to said balloon conforming to a curved arterial passage such that the balloon remains stably positioned when pumping in the curved passage,

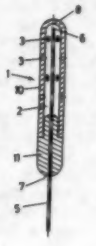
an inflation catheter having a first end with a curvature matching said supporting structure connected to said balloon second end and extending to a handle assembly which is thereby interconnected with the balloon, said supporting structure defining an inner lumen extending in said catheter for receiving a straightening member inserted through said handle which straightens the balloon for insertion.

4,943,276

DEVICE FOR THE DISCHARGE OF INTESTINAL GASES

Dino Ghedina, Schillerstrabe 4, A-6020 Innsbruck, Austria

Continuation of Ser. No. 64,884, Jun. 22, 1987, abandoned. This application Jun. 13, 1989, Ser. No. 366,314
Claims priority, application Austria, Jul. 15, 1986, 1917/86
Int. Cl.[5] A61B *19/00*
U.S. Cl. 600—29 6 Claims



1. A device for the pressure-reduced discharge of intestinal gases consisting of:

two opposed end portions, both of which have rounded end portions and a middle cylindrical wall portion, one end insertion portion and the middle portion being a void hollow portion for collecting gas and is of flexible material, the middle portion having a plurality of gas intake openings, said rounded one end portion being impermeable to gas;

a second solid end portion securing a tube means;

said gas collecting void positioned within said hollow wall and end portions into which gas passes through said plurality of gas intake openings;

said tube means through which gas will exit the device located within said gas collecting void, the outside diameter of the tube means being substantially smaller than that of the gas collecting void and the tube means being of a sufficient length to extend from outside the second solid portion of the device into the interior of the gas collecting void to the area of the rounded gas-impermeable insertion end portion of the gas collecting void, said tube means being of a length which permits positioning of the second solid end portion beyond a sphincter muscle.

4,943,277

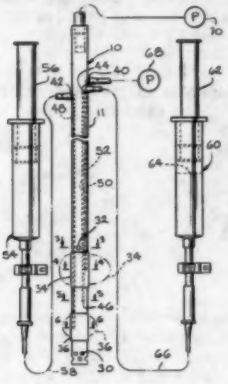
RETROGRADE CORONARY SINUS CARDIOPLEGIA CANNULA AND METHOD FOR USING SAME IN HEART SURGERY

Steven F. Bolling, 3456 Daleview Dr., Ann Arbor, Mich. 48105

Filed Mar. 24, 1989, Ser. No. 328,228
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—96 12 Claims

1. Cannula apparatus for delivering cardioplegia to the veins of the heart during cardiac surgery, said apparatus comprising a main tubular member adapted to be inserted into the right atrium cavity of the heart to a position extending into the inferior vena cava, said tubular member having spaced openings communicating with both the inferior and superior vena cavas, said openings being for the purpose of enabling blood to be oxygenated to enter the tubular member for transport to blood oxygenating apparatus, passage means operatively associated with said tubular member and having a discharge port located between said openings, said passage means having an inlet adapted to be connected to a source of cardioplegic solution, means forming a pair of fluid passages on said tubular member, a first inflatable seal member communicating with one of said fluid passages and being operable on inflation to block said inferior vena cavity around said tubular member, a second inflatable seal member communicating with the other

one of said fluid passages and being operable on inflation to block the atrium cavity around said tubular member so as to form an isolated chamber around said tubular member and between said seal members communicating only with said



discharge port for cardioplegic solution and the heart's coronary sinus thereby enabling a desired flow of cardioplegia to the coronary sinus from said isolated chamber so long as said seal members remain inflated.

4,943,278

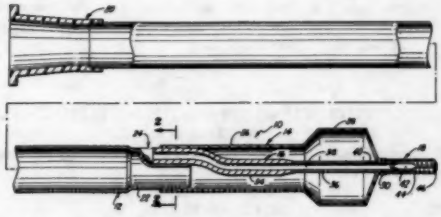
DILATATION BALLOON CATHETER

Charles L. Euteneuer, St. Michael; Richard C. Mattison, Mound; Daniel O. Adams, Blaine; Thomas R. Hektner, Minnetonka, and Peter T. Keith, Edina, all of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.

Filed Feb. 29, 1988, Ser. No. 162,004

Int. Cl.[5] A61M *29/00*

U.S. Cl. 604—96 **31 Claims**



1. A catheter for use in angioplasty, the catheter comprising:

an elongate flexible tubular member having an interior passage extending from a proximal end to a distal end, the tubular member having a longitudinally extending bonding region formed in a portion of a side wall of the tubular member adjacent to its distal end;

a core member having a smaller outer diameter than the tubular member, the core member having a proximal end positioned in the bonding region and bonded to the tubular member and the core member extending distally beyond the distal end of the tubular member;

an inflatable balloon member having a first end bonded to the proximal end of the core member and to the distal end of the tubular member and having a second end connected to the core member, the balloon member extending around the core member and having an interior in fluid communication with the interior passage of the tubular member; and

wherein the core member has a vent passage which extends between a vent opening in communication with the interior of the balloon member and an exterior opening proximate the proximal end of the core member.

4,943,279

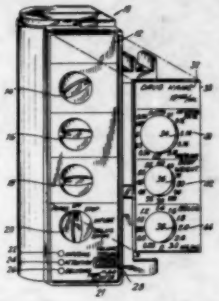
MEDICAL PUMP WITH INFUSION CONTROLLED BY A DETACHABLE CODED LABEL

Nicholas G. Samiotes, Westwood, and Paul Lucas, Groton, both of Mass., assignors to C.R. Bard, Inc., Murray Hill, N.J.

Filed Sep. 30, 1988, Ser. No. 251,563

Int. Cl.[5] A61M *1/00*

U.S. Cl. 604—151 **16 Claims**



1. An apparatus comprising:

pumping means;

means for controlling operation of said pumping means, including sensing means and manual controls for manually setting the desired operation of said pumping means; and

indicator means, separable from said means for controlling, which includes:

information in a pre-arranged configuration for a selected mode of pump operation; and

visual scales corresponding to said pre-arranged configuration, said visual scales indicating the desired setting for said manual controls when said indicator means is placed adjacent to said manual controls;

wherein said sensing means senses said pre-arranged configuration and is responsive thereto to alter calculations for controlling said pumping means in accordance with said pre-arranged configuration and with said visual scales when said indicator means is placed adjacent to said manual controls.

4,943,280

SELF-SEATING FLAPPER VALVE FOR AN INSUFFLATION CANNULA ASSEMBLY

Jack R. Lander, Danbury, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Dec. 31, 1987, Ser. No. 140,025

Int. Cl.[5] A61M *5/18*

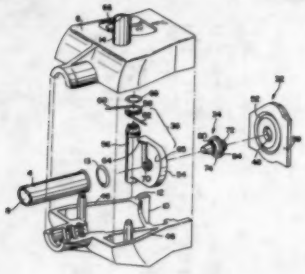
U.S. Cl. 604—169 **12 Claims**

12. An insufflation cannula assembly, which comprises:

a cannula having opposite end portions;

a housing mounted on one end of the cannula, said housing having an opening formed therein; and

a flapper valve mounted in the housing, said flapper valve including a valve seat disposed at the housing opening and having an opening formed therein to allow a surgical instrument to pass therethrough and into the cannula, said valve seat formed of a resilient material and having an annular portion of reduced thickness defining said opening, said annular portion being of greater flexibility than adjacent portions thereof due to said reduced thickness, a valve plug adapted to engage said valve seat at the opening thereof and to form a seal with said valve seat, and means for mounting said valve plug and for pivoting said valve plug into and out of engagement with said valve seat, said valve plug being movable on said plug mounting means so as to provide said valve plug with self-seating capability to allow said valve plug to automatically align itself with said valve seat opening when said plug and said valve seat are in engagement, whereby said self-seating capability of said valve plug combines with said resilient annular flexible portion of said valve seat to provide a substantially gas tight seal.



4,943,281

SYRINGE

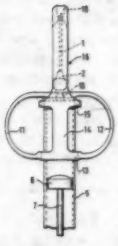
Lutz Kothe, Bodmaner Str. 15, D-7760 Radolfzell 14, Fed. Rep. of Germany

Filed Jan. 18, 1989, Ser. No. 298,403

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1988, 8800767[U]; Apr. 7, 1988, 8804592[U]

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—192 **22 Claims**



1. A syringe which comprises: a cannula having a cannula tip; a cylindrical tube connected to said cannula at a location spaced from said cannula tip; a cannula guard for said cannula; a protective bow of said cannula guard being displaceable inwardly towards the cylindrical tube to retract the cannula guard; and a recess of said bow embracing the cannula.

4,943,282

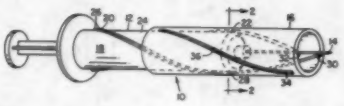
SHIELD FOR DEVICES CAPABLE OF PENETRATING SKIN

Mary J. Page, 4634 French Meadow, San Antonio, Tex. 78250; Benton W. Hamilton, 13403 Townwood, Houston, Tex. 77045; Bruce L. Skiles, 15 Charleston Park, No. 714, Houston, Tex. 77025, and Robert V. Reinhart, Jr., 2303 Moss Ter., San Antonio, Tex. 78232

Division of Ser. No. 181,387, Apr. 14, 1988, abandoned. This application Mar. 13, 1989, Ser. No. 311,044

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—198 **3 Claims**



1. An apparatus for inhibiting accidental injury to a user of a device having a part thereof capable of penetrating skin of said user, said apparatus comprising a sleeve slidably and rotatably engaging a portion of said device adjacent to said penetrating part;

first means connected to said sleeve for retaining said sleeve at a first position on said portion of said device whereby the penetrating part is exposed, and

second means connected to said sleeve for retaining said sleeve at a second position on said portion of said device whereby a part of the sleeve substantially surrounds the penetrating part, the first and second sleeve retaining means comprising

at least one groove inscribed along an axial length of an inside surface of said sleeve, each groove being substantially circumferentially equidistant from any other groove,

at least one ridge carried on said adjacent portion of said device, each ridge slidably engaging one of the at least one grooves,

at least one slot along the axial length of said tube, each slot being substantially circumferentially equidistant from the at least one groove, and

at least one peg carried on said penetrating part adjacent portion of said device, each peg slidably engaging one of the at least one slots.

4,943,283

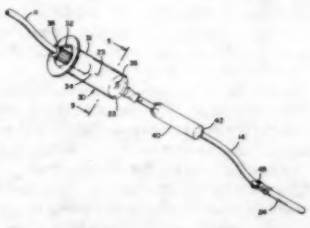
BLOOD COLLECTING APPARATUS WITH SHIELDED NEEDLES

J. Martin Hogan, Long Beach, Calif., assignor to City of Hope, Duarte, Calif.

Filed Jul. 20, 1988, Ser. No. 221,603

Int. Cl.[5] A61M *5/32*

U.S. Cl. 604—198 **8 Claims**



2. In an apparatus for collecting blood or other body fluids, wherein a first length of tubing has a first needle on one end for insertion into the vein of a donor and a second needle on the

other end for filling test tubes with blood for various screening tests, the improvement comprising:

a combination needle shield and test tube receptacle on the length of tubing in shielding relationship to the second needle to protect health workers against exposure to the sharpened point of the needle and to receive a test tube for operative association with the needle so that the test tube may be filled with blood or other body fluid,

said combination needle shield and test5 bue receptacle comprising part of a frangible needle seal for joining said first length of tubing with a second length of tubing, said frangible needle seal including a rigid frangible tube fixed at one end to one end of the shield and extending coaxially therewithin and over said needle, said frangible tube being fixed at its other end to the second length of tubing and being joined to said shield through a weakened area so that the tube may be broken from the shield and removed, to separate the second length of tubing from the first length of tubing and to expose the needle inside the shield.

4,943,284

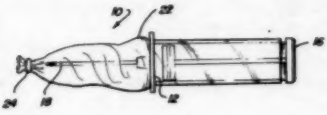
SHEATH FOR DEVICES FOR INJECTING OR WITHDRAWING BODY FLUIDS

Frederick L. Erlich, 29540 Meadowlane Dr., Southfield, Mich. 48076

Continuation of Ser. No. 23,813, Mar. 9, 1987, Pat. No. 4,772,275. This application Sep. 6, 1988, Ser. No. 240,268

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—263 **8 Claims**



1. A disposable medical device for use in a patient, the device protecting attendant personnel from contamination associated with the device after the device has been withdrawn from the patient, the device comprising:

(a) a hollow tubular apparatus having a body contact end and a non-body contact end, the apparatus having a tip disposed at the body contact end; and

(b) a flexible sheath being secured to the hollow tubular apparatus between the body contact end and the non-body contact end, the flexible sheath having a stowed-retracted position and an enveloping position, the flexible sheath being completely stowed when in the stowed-retracted position, the flexible sheath being unstowed and extended in the enveloping position, the length of the flexible sheath in the enveloping position being great enough to extend beyond the tip of the hollow tubular apparatus; and

wherein the flexible sheath is in the stowed-retracted position until after the body-contact end of the hollow tubular apparatus is removed from the circulatory system of the patient, at which time the flexible sheath is extended beyond the tip of the hollow tubular apparatus.

4,943,285

UNDULATING RECTAL SPECULUM

Robert A. Hawks, 3602 W. Danbury Dr., Glendale, Ariz. 85308

Filed Dec. 22, 1988, Ser. No. 289,566

Int. Cl.[5] A61M *3/02*

U.S. Cl. 604—275 **9 Claims**

1. A rectal speculum for use with a colonic lavage machine, said speculum comprising in combination:

(a) a hollow main tube, said main tube including a distal end for insertion into a patient's rectum and a proximal end for connection to a waste discharge hose;

(b) an axially undulating exterior surface having an annular depression intermediate a pair of annular expansions and disposed about at least an axial length of said main tube for circumscribingly receiving and being gripped by the rectal sphincter muscle of a patient undergoing clonic lavage, one of said pair of annular expansions extending posteriorly from the anterior end of said main tube and having an increasing rate of annular expansion to define a truncated cone with a concave surface extending posteriorly from the anterior end of said main tube to the approximate apex of said one annular expansion, said one annular expansion having a decreasing rate of annular contraction posteriorly from the approximate apex to define a truncated cone with a concave surface extending posteriorly from the

approximate apex of said one annular expansion to the approximate midpoint of said annular depression, the other of said pair of annular expansions extending posteriorly from the approximate midpoint of said annular depression and having an increasing rate of annular expansion to define a truncated cone with a concave surface extending posteriorly from the approximate midpoint of said annular depression to the approximate apex of said other annular expansion; and

(c) an inlet tube intersecting with said main tube for directing fluids into said main tube, said inlet tube having a diameter less than the diameter of said main tube.

4,943,286

PATIENT UNDERPAD

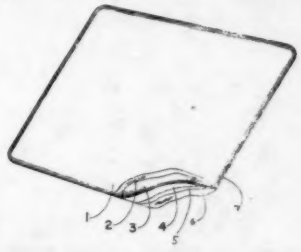
Kenneth W. Armstead, P.O. Box 598, Lebanon, Tenn. 37087

Filed Dec. 30, 1988, Ser. No. 292,092

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—558 **5 Claims**



1. An improved reusable patient underpad comprising:

(a) a top absorbent layer of heat-treated polyester rayon needle form non-woven fabric;

(b) a second layer of non-woven polyester;

(c) a third layer of water impervious synthetic material, bonded to said second layer; and

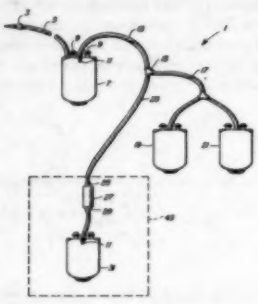
(d) a fourth layer of synthetic fleece warpknit fabric bonded to said third layer.

4,943,287

RED BLOOD CELL STORAGE SYSTEM

Raleigh A. Carmen, Concord, Calif., assignor to Miles Inc., Elkhart, Ind.

Filed Jul. 17, 1989, Ser. No. 380,949
Int. Cl.[5] A61J 1/00
U.S. Cl. 604—408 10 Claims



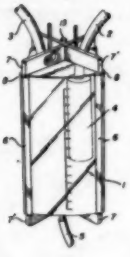
1. In a method of storing red blood cells which comprises mixing packed red blood cells and white blood cells with a storage solution and storing the mixture in a plastic blood bag for a prolonged period of time, the improvement which comprises removal of substantially all white blood cells from the mixture prior to placement of the mixture in the blood bag and then storing the red blood cells in a plasticized polyvinylchloride bag made with a plasticizer that releases less than 1 ppm plasticizer into the stored red blood cells at 42 days storage.

4,943,288

LIQUID REINFUSION BAG SYSTEM

Leonard D. Kurtz, Woodmere, and Joseph LiCausi, Port Jefferson Station, both of N.Y., assignors to BioResearch, Inc., Farmingdale, N.Y.

Continuation of Ser. No. 364,583, Jun. 12, 1989, abandoned, which is a continuation of Ser. No. 160,293, Feb. 25, 1988, abandoned. This application Oct. 13, 1989, Ser. No. 420,718
Int. Cl.[5] A61M 5/14
U.S. Cl. 604—408 5 Claims



1. A reinfusion bag including a flexible container having a side wall and top and bottom end walls, an inlet tube in the top end wall, an outlet tube adapted to be connected to a suction source in the top end wall, a reinfusion tube in the bottom end wall, a plurality of relatively rigid frame members disposed around and connected to the side wall of the flexible container, and locking means releasably attached to said frame members and extending across the top and bottom end walls for retaining the end walls of the flexible container in an extended position so that the container is maintained in an open position.

4,943,289

APPARATUS FOR REMOVING AN ELONGATED STRUCTURE IMPLANTED IN BIOLOGICAL TISSUE

Louis Goode, Evans City, and Frederick J. Shipko, Spring Church, both of Pa., assignors to Cook Pacemaker Corporation, Leechburg, Pa.

Continuation-in-part of Ser. No. 347,217, May 3, 1989, which is a continuation-in-part of Ser. No. 295,100, Jan. 17, 1989, which is a continuation-in-part of Ser. No. 269,711, Nov. 9, 1988. This application Jun. 9, 1989, Ser. No. 363,960
Int. Cl.[5] A61B 17/00
U.S. Cl. 606—1 10 Claims

1. Apparatus for removing a pacemaker lead implanted in a heart, comprising:

stylet means insertable into a longitudinal passageway of said implanted lead for controlling movement of said lead;

coil means having a distal end attached about a distal end of said stylet means and operable for securing said distal end of said stylet means to said lead when said stylet means is inserted in said passageway; and

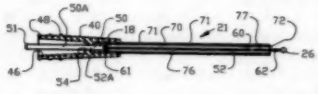
catch means attached to and extending from a proximal end of said coil means and having a segment folded back thereon for engaging said lead when said coil means is operated.

4,943,290

ELECTROLYTE PURGING ELECTRODE TIP

Frederick W. Rexroth, Dunedin, and F. Barry Bays, Seminole, both of Fla., assignors to Concept Inc.

Continuation of Ser. No. 65,823, Jun. 23, 1987. This application Apr. 27, 1989, Ser. No. 343,730
Int. Cl.[5] A61B 17/39
U.S. Cl. 606—45 7 Claims



1. An electrolyte fluid purging electrosurgical device for use with an electrode holder connected to an electrical power source and with a source of non-electrically conductive fluid for enabling electrosurgery at a surgical site which is surrounded by an electrically conductive fluid, comprising:

an electrically conductive electrode shaft having a first electrode end and a second electrode end;

an insulating tubular duct defining a duct conduit extending between a first duct end and a second duct end;

said electrode shaft being disposed within said duct conduit with said first electrode end of said electrode shaft extending beyond said first duct end of said insulating tubular duct for defining an electrode shaft connecting means for connection to the electrode holder;

said second electrode end of said electrode shaft extending beyond said second duct end of said insulating tubular duct for defining an electrode tip to provide electrical current to the surgical site;

a plurality of support walls extending longitudinally within

said duct conduit of said insulating tubular duct and disposed between said insulating tubular duct and said electrode shaft for supporting said electrode shaft within said duct conduit of said insulating tubular duct and for defining a plurality of conduit channels encompassing said electrode shaft; and

means for connecting said first duct end of said insulating tubular duct to the source of non-electrically conductive fluid for enabling non-electrically conductive fluid to flow through said plurality of conduit channels of said insulating tubular duct to deliver the electrically non-conductive fluid to an immediate area proximate said electrode tip to displace the electrically conductive fluid from the immediate area proximate the surgical site when said electrode tip is positioned at the surgical site to enable electrosurgical treatment thereat.

4,943,291

DRILLING FEELER, IN PARTICULAR FOR POSITIONING AND SECURING A MEDULLARY NAIL

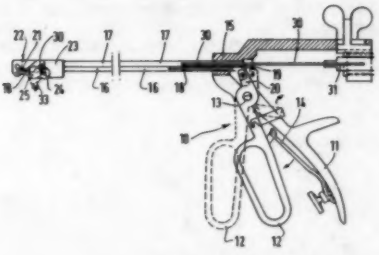
Christian Tanguy, Choisy le Roi, France, assignor to Zimmer S.A., Vitry sur Seine Cedex, France

Filed Dec. 19, 1988, Ser. No. 286,681

Claims priority, application France, Dec. 18, 1987, 87 17716

Int. Cl.[5] A61F *5/04*

U.S. Cl. 606—64 **5 Claims**



1. Drilling feeler, in particular for positioning and fixing a medullary nail in which, through external gripping means, is introduced into the medullary nail and is placed in alignment with the axis of an inlet pin or screw hole of the wall of this nail, a drilling tool integral with a sliding block bearing means for positioning and blocking the said nail, this tool being mounted at the distal end of a driving rotating spindle, at least partially flexible, wherein the distal end of the spindle carrying the tool is housed in a bore of a sleeve protruding from a drilling head, said head being movable around an axle carried by the block sliding between a disengagement position allowing the sliding of the said head in the nail and an engagement position in which the sleeve is engaged in the inlet pin or screw hole, the feeler furthermore comprising a blocking wedge hinged to the end of a rod connected to the gripping means, this wedge being adapted to move closer to or away from the drilling head, in order to respectively maintain it in engagement position or allow its tilting towards disengagement position.

4,943,292

PLATE FOR BROKEN BONE FIXATION

Amnon Foux, Haifa, Israel, assignor to National Research Council of Canada, Ottawa, Canada

Filed Nov. 8, 1989, Ser. No. 433,144

Int. Cl.[5] A61B *17/58*

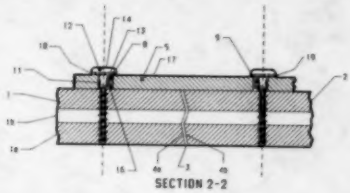
U.S. Cl. 606—70 **13 Claims**

1. A device adapted for placement in the body of a person to span a fracture in a bone and to be connected by means of screws to the bone on both sides of the fracture, comprising a plate, cushions, and screws, all constructed of biologically-compatible material, in which:

said plate is substantially rigid;

said plate is provided with a plurality of holes that enable passage of said screws through said plate such that the central axis of each of said screws lies approximately in a plane that contains the long axis of the bone and is nearly perpendicular to said long axis when the device is installed;

at least all those holes which are on one side of the fracture



when the device is installed are elongated in a direction substantially parallel to the long axis of the bone when the device is installed;

each hole which is an elongated hole is partially filled with a said cushion which is an elastic biologically-compatible material positioned with a snug fit in the portion of said elongated hole which is to be closer to the fracture when the device is installed, said cushion being of a shape and material that permits one of said screws to pass through the unfilled portion of said elongated hole for the purpose of fastening the device to the bone.

4,943,293

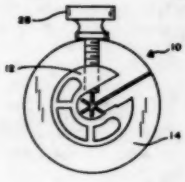
SURGICAL PIN SITE SHIELD

Harry E. Lee, Jr., Southaven, Miss., assignor to Engineering & Precision Machining, Inc., Memphis, Tenn.

Filed Sep. 21, 1989, Ser. No. 410,277

Int. Cl.[5] A61F *5/04*

U.S. Cl. 606—96 **9 Claims**



1. A pin site shield for attachment to a surgical pin, comprising:

(a) a collar having a slot for receipt of the surgical pin;

(b) a surgical sponge attached to said collar, said surgical sponge comprising

a foam pad having a side adjacent to said collar and a side remote from said collar, and

a tricot material attached to said foam pad on said side remote from said collar,

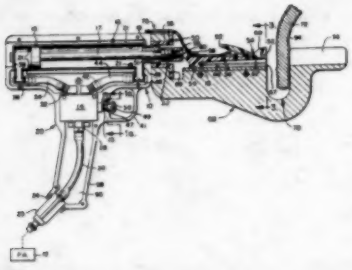
said surgical sponge having a slit in substantial registration with said slot in said collar, allowing the surgical pin to pass inwardly and outwardly within said slot; and,

(c) means for securing the pin in said slot.

4,943,294
POWER-DRIVEN APPLICATOR FOR TAGGING LIVESTOCK

Ronald K. Knapp, Cody, Wyo., assignor to Y-Tex Corporation, Cody, Wyo.

Filed Mar. 30, 1988, Ser. No. 175,493
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—117 **22 Claims**



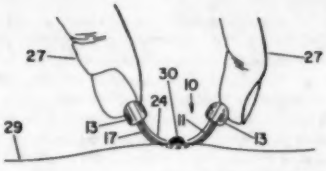
1. A hand-portable livestock tagging device operable by a pressurized pneumatic fluid source comprising:
- a casing holdable by one hand and having support means for positioning an object on livestock to be tagged;
- a valve means located in said casing for controlling the direction of flow of pressurized pneumatic fluid;
- manually actuable means mounted in said casing and connected to said valve means for controlling the position of said valve means;
- a piston cylinder located within said casing;
- a double-acting piston carried within said piston cylinder and driven fully and rapidly by the pressurized pneumatic fluid in a first direction and in a second opposite direction in accordance with the position of said valve means;
- means for directing the pressurized fluid from said pneumatic fluid source to said valve means and from said valve means to said piston cylinder;
- piercing means connected to and moving with said piston for penetrating the object to be tagged when driven by said piston in said first direction and for retracting from the object when driven by the piston in said second direction; and
- means for attaching a tag having an anchor portion to said piercing means such that the anchor portion of the tag will be forced through the object to be tagged by said piercing means when the piercing means is driven fully and rapidly in said first direction.

4,943,295
SURGICAL CUTTING TOOL

Thaddeus J. Hartlaub, 6765 Schroeder Rd.; Mark T. Hartlaub, 14 Celia Ct., both of Madison, Wis. 53711, and Paul P. Hartlaub, 1135 S. 23rd St., Milwaukee, Wis. 53204

Filed Jul. 13, 1988, Ser. No. 218,072
Int. Cl.[5] A61B *17/32, 19/00*
U.S. Cl. 606—131 **13 Claims**

8. A blade holder for safely forming a thin flexible blade with two side margins and a keen-edged front margin into a surgical cutting tool for removing portions of human skin by cutting below the surface of the skin, comprising: two finger grips for gripping by the fingers of a user, each finger grip being a body of material which includes an inwardly facing engagement surface which can be affixed to and extend along one blade side margin, and an outwardly facing gripping surface which is spaced laterally outwardly from the blade side margin when the finger grips are affixed to the blade, the gripping surface presenting a relatively large area for gripping compared to the area of the side margin of the blade so that the blade holder and blade can be controlled and held safely by finger engagement of the gripping surfaces so that the flexible blade may be readily bent in response to finger pressure applied to the relatively large surface areas of the gripping surfaces of

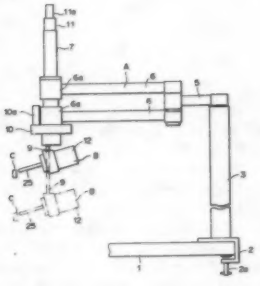


the two finger grips and the keen-edged front margin of the flexible blade presents a variable convex U-shaped cutting edge for cutting a selected depth beneath a limited area of skin surface and wherein each gripping surface has a rounded notch which conforms in approximate shape to a finger.

4,943,296
ROBOT FOR SURGICAL OPERATION

Hiroyasu Funakubo; Takeyoshi Dohi, both of Tokyo; Ichiro Sakuma, Akishima, and Takashi Komeda, Tokyo, all of Japan, assignors to Life Technology Research Foundation, Tokyo, Japan

Continuation of Ser. No. 35,661, Mar. 26, 1987, abandoned. This application Dec. 12, 1988, Ser. No. 285,341
Claims priority, application Japan, Mar. 28, 1986, 61-68424; Mar. 25, 1987, 62-69086
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—166 **13 Claims**



1. A robot for surgical operation, comprising:
(a) two spaced vertical support means;
(b) two sets of articulated arm means, each said set of arm means being rotatably supported at one end thereof to one of said vertical support means and extending substantially horizontally, each set of said arm means consisting of a first elongate member and a second elongate member pivotally connected to each other to provide said articulation, said two sets of arm means being pivotally connected at the free or distal ends thereof to each other;
(c) head drive means mounted on an axis extending through said connected free or distal ends of said two sets of articulated arm means, for driving a vertically movable member into vertical translatory motion and into rotational motion about the longitudinal axis thereof; and
(d) a drive mechanism mounted to the lower end of said vertically movable member for controllably supporting and driving at an extended extremity thereof a hollow cylindrical head, said drive mechanism comprising

a moving pipe for supporting and rocking the head,

a rotary pipe slidably supported within the moving pipe, the head being attached swingably to the rotary pipe attached to controllably swing about the longitudinal axis of the rotary pipe such that rotation of said rotary pipe about the longitudinal axis thereof causes the head to swing about the longitudinal axis of the rotary pipe,

a hollow cylindrical treatment member rotatably supported by the head to provide a predetermined treatment at a treatment end thereof,

a rotary shaft slidably and rotatably supported within the rotary pipe and connected to the head to rotate a surface treatment member attached thereto, and

a link mechanism for connecting said moving pipe to said head so that longitudinal movement of the moving pipe relative to the rotary pipe causes said head to swing about an axis perpendicular to the longitudinal axis of said moving pipe.

4,943,297

DEVICE FOR PREPARATION OF INTRAVENOUS FILTER FOR IMPLANTATION

Viktor S. Saveliev, ulitsa Donskaya, 27, kv. 29; Evgeny G. Yablokov, Rogozhsky val, 6, kv. 45; Vladimir I. Prokubovsky, Khoroshevskoe shosse, 66, kv. 71, all of Moscow; Stepan M. Kolody, korpus 505, kv. 28, Moskovskaya oblast, Zelenograd; Sergei V. Saveliev, ulitsa Bolshaya Bronnaya, 9/I, kv. 16, and Ary A. Smirnov, Leningradsky prospekt, 28, kv. 120, both of Moscow, all of U.S.S.R.

Filed Jan. 6, 1989, Ser. No. 294,468

Claims priority, application U.S.S.R., Jan. 2, 1988, 4351223

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—200 **1 Claim**

1. A device for preparation of an intravenous filter for implantation, comprising:

a guide element having a cylindrical and a conical portion;

an applicator, comprising:

a capsule which is detachably connected with said cylindrical portion of the guide element, said capsule carrying an intravenous filter and having a base;

a plurality of springs located at said base; each of said springs having one end contacting said base and the other end free; each of said springs curved in such a manner that said free end of said spring, together with the free ends of all of said springs define a pyriform body of revolution, which encompasses said capsule;

a conducting catheter connected to said capsule;

a sleeve installed on said catheter and traversable lengthwise said catheter during preparation for surgery in order to interact with said springs, thus urging said free ends of said springs to be brought together until they are in contact with said capsule;

a stylet accommodated inside said catheter and said capsule and having a thread for holding said intravenous filter; and

a collet grip adapted to interact with said stylet.

4,943,298

CEREBRAL ANEURYSM CLIP

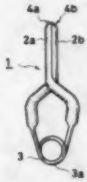
Shigekiyo Fujita, 8-22, kitashinzaike 1-Chome, Himeji, Hyogo; Toyokazu Kurushima, Aichi; Hiroaki Kano, Aichi, and Hiromitsu Hiraiwa, Aichi, all of Japan, assignors to Inax Corporation, Tokoname and Shigekiyo Fujita, Himeji, both of, Japan

Filed Jun. 2, 1989, Ser. No. 360,588

Claims priority, application Japan, Jun. 9, 1988, 63-142634

Int. Cl.[5] A61B *17/00*

U.S. Cl. 606—158 **9 Claims**



1. A clip for cerebral aneurysm comprising a means which is made of a ceramic and which has a function of clipping a root part of a lump of cerebral aneurysm and a spring means which has a function of imparting a power for clipping said root part to said clipping means.

4,943,299

LEVELLING AGENTS FOR DISPERSE DYEING OF POLYESTER: ETHOXYLATE OR PROPOXYLATE OF SUBSTITUTED PHENOL, EMULSIFIER AND CARRIER

Hans Schulze, Cologne; Klaus Walz, Leverkusen; Frank Bartkowiak, Cologne, and Karlhans Jakobs, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 22, 1988, Ser. No. 247,796

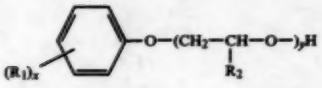
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734159

Int. Cl.[5] D06P *1/65, 3/54*

U.S. Cl. 8—610 12 Claims

1. A levelling agent consisting essentially of

(I) a compound of the formula



in which

R_1 denotes C_1–C_3-alkyl, cyclohexyl, benzyl, phenyethyl or 2-phenylisopropyl, the rings of which are unsubstituted or substituted by C_1–C_4-alkyl,

R_2 denotes hydrogen or methyl,

x denotes 1, 2 or 3 and

y denotes 0 to 5, and

(II) an emulsifier, with or without (III) a carrier for the dyeing of polyesters,

wherein the emulsifier II comprises (a) 8 or more moles of ethylene oxide or propylene oxide reacted with (b) castor oil, soybean oil, a C_{18}–C_{22}-alkanol, a C_8–C_{12}-alkylphenol or a phenyl-C_1–C_3-alkylphenol, or alternatively the emulsifier II comprises an alkali metal, an alkaline earth metal or an ammonium salt of an aliphatic sulfonic acid having a total of at least 10 carbon atoms or of an aromatic sulfonic acid having a total of at least 10 carbon atoms, or mixtures thereof, wherein the emulsifier II serves to emulsify the compound I and optionally to emulsify the carrier III in water.

4,943,300

PROCESS FOR CONDITIONING COTTON

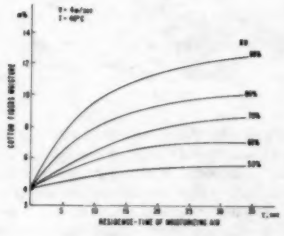
Lev Vinnikov, 2/8 Oswaldo Arenia, Beer-Sheva, Israel

Filed Jul. 28, 1988, Ser. No. 225,242

Claims priority, application Israel, Aug. 18, 1987, 83583

Int. Cl.[5] D01B *3/04*

U.S. Cl. 19—66 R 6 Claims



1. A process for moisturizing cleaned cotton to a moisture content between about 8 and about 9% comprising:

providing a stream of humid air having a predetermined relative humidity and a temperature between about 35 and about 95° C.;

contacting said cotton with said stream of humid air so that said cotton adsorbs water vapor from said humid air so as to provide a stream of reduced humidity air,

determining the relative humidity of said stream of reduced humidity air; and

controlling said predetermined relative humidity so that said stream of reduced humidity air has a relative humidity between about 65 and about 80%.

4,943,301

GRANULATION OF MAGNESIUM OXIDE PARTICLES

Dennis C. Nagle, Ellicott City, and Richard H. Van de Walle, Columbia, both of Md., assignors to Martin Marietta Magnesia Specialties Inc., Hunt Valley, Md.

Filed Aug. 1, 1988, Ser. No. 225,878

Int. Cl.[5] C04B *2/00;* C01F *5/02, 5/16*

U.S. Cl. 23—313 R 15 Claims

1. A method of granulating highly reactive, lightburned magnesia having a surface area of at least ten square meters per gram as measured by the B.E.T. nitrogen absorption method, said method consisting of adding to dry magnesia powder 20-35 percent by weight of the total mixture of liquid organic material selected from alcohols or ketones having the formulae, respectively:

ROH and RCR

wherein each R, independently, is an alkyl group having from 1 to 4 carbon atoms, and wherein said liquid organic material contains no more than about 20 percent by weight water, blending said materials to thereby form granules, and drying the granules to volatilize said liquid organic material.

4,943,302

FUEL COMPOSITION WITH A HIGH ENERGY CONTENT

Philip Eaton, Chicago, Ill.; Nereo Nodari, Spino D'Adda, Italy; Carlo Neri; Luigi Cassar, both of San Donato Milanese, Italy; Fabio Monti, Rome, Italy, and Fausto Alberici, Peschiera Borromeo, Italy, assignors to Enichem Synthesis S.p.A., Palermo and AGIP Petroli S.p.A., Rome, both of, Italy

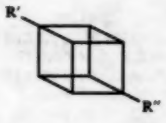
Filed Oct. 11, 1989, Ser. No. 420,050

Claims priority, application Italy, Oct. 14, 1988, 22296 A/88

Int. Cl.[5] C10L *1/16*

U.S. Cl. 44—56 2 Claims

1. Fuel composition for direct-ignition internal combustion engines, with a high energy content, containing a gasoline from petroleum and an amount of up to 90% by volume, as referred to the same fuel composition, of hydrocarbon "cubane" or of its mono-alkyl-or di-alkyl-derivatives, to be defined by means of the formula:



wherein R' and R'' represent, independently from each other, a hydrogen atom or an alkyl radical containing from 1 to 3 carbon atoms.

4,943,303

CETANE IMPROVER

Joseph W. Plalet, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

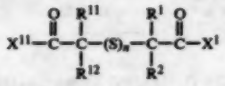
Filed Nov. 25, 1985, Ser. No. 801,528

Int. Cl.[5] C10L *1/10*

U.S. Cl. 44—57 13 Claims

1. A composition comprising a hydrocarbon diesel fuel and

an ignition promoting amount of a sulfur containing compound having the formula:



wherein n is an integer from 1 to about 8; wherein R^2 and R^{12}, independently, are H or a hydrocarbyl having from 1 to 18 carbon atoms; wherein X^1 and X^{11}, independently, are H, an alkyl having from 1 to 20 carbon atoms, OH, OR^* where R^* is an alkyl having from 1 to about 22 carbon atoms, or

where R^{**} and R^{***}, are, independently, H or an alkyl having from 1 to about 20 carbon atoms; and wherein R^1 and R^{11}, independently, are H, a hydrocarbyl having from 1 to about 18 carbon atoms or

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4,943,304

PROCESS FOR THE PURIFICATION OF BULK GASES USING CHABAZITE ADSORBENTS

Charles G. Coe, Macungie, and Thomas R. Gaffney, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 6, 1989, Ser. No. 334,668
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—66 **7 Claims**

1. In a process for the selective adsorption of one or more minor constituents from a bulk gas stream with a chabazite in which the bulk gas is size excluded from the pore structure of the chabazite or the minor constituted to be separated has a heat of adsorption greater than the bulk gas, the improvement which comprises separating the minor constituents utilizing a dehydrated calcium-exchanged chabazite having a Si/Al ratio of 1.9 to 2.3, a cation siting value f_s, of about 0.9 to 1, a cation distribution value, f_d, of about 0.74 to 1 and an adsorption capacity, C_p, of at least about 40 cc N_2/g at 30 ° C. and 1 atm under conditions such that the partial pressure of the minor constituent is in the linear low pressure region of the isotherm for the minor constituent.

4,943,305

AERATING APPARATUS FOR EXPELLING VOLATILE IMPURITIES FROM GROUND WATER

Bruno Bernhardt, Goerdelerstr. 2 W 113, D-7410 Reutlingen 11-Betzingen, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 359,096
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1988, 8808089[U]
Int. Cl.[5] B01D *19/00*
U.S. Cl. 55—170 **3 Claims**

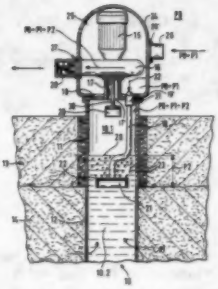
1. An aerating apparatus for expelling volatile impurities from ground water standing under a ground water pressure and from ground through which said ground water flows comprising:

an aeration shaft in said ground;

a vacuum generator mounted above said aeration shaft to generate a partial vacuum in said aeration shaft in the vicinity of said ground water to be purified;

a container including a pressurized receiving chamber mounted on an upper end of said aeration shaft, said vacuum generator forming said partial vacuum being located in said pressure receiving chamber;

means for feeding fresh air into said ground water collected in said aeration shaft below a water level of said ground water in said aeration shaft, wherein said means for feeding said fresh air comprises an air receiving space bounded by a screen wall located in said ground water and an air duct connecting said air receiving space with said pressurized receiving chamber and a float valve in said air duct leading to said air receiving space;



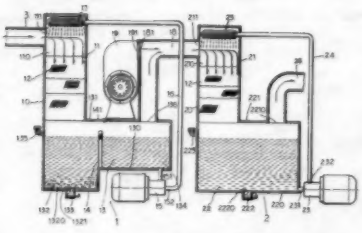
said fresh air being conductible to said pressurized receiving chamber at a fresh air pressure balancing said ground water pressure so that said volatile impurities expelled from said ground water in said aeration shaft are forced through said vacuum generator and out a second exhaust opening with accompanying air.

4,943,306

EXHAUST GAS PURIFYING SYSTEM

Ching-Chi Cho, No. 3, Lane 6, Ta-Chiao 2nd Street, Yung kang Hsiang, Tainan Hsien, Taiwan

Filed Aug. 25, 1989, Ser. No. 398,497
Int. Cl.[5] B01D *47/00*
U.S. Cl. 44—228 **1 Claim**



1. An exhaust gas purifying system comprising a first and a second purifiers side by side in combination,

the first purifier including a casing integrally formed with a water tank, having a perforated top and being divided into a first compartment having a bottom and a second compartment having a bottom extending downwardly from the bottom of the first compartment by means of a vertical strainer means and a chamber corresponding to an opening in the top, extending upwardly from the top and forming a vertical passage along the chamber downwardly in alignment with the first compartment, strainer means fitted in the chamber across the passage, means for leading exhaust gases into the chamber to flow along the passage through the strainer means, means for feeding clean water into the water tank, water spray means in the chamber over the strainer means for spraying water downwardly

along the passage, means for supplying water from the water tank to the water spray means, means provided in the bottom of the first compartment for draining and means in the top of the water tank for discharging the exhaust gases;

the second purifier including a casing integrally formed with a second water tank, having a perforated top and bottom, and a second chamber corresponding to an opening in the top, extending upwardly from the top and forming a vertical passage along the second chamber, a second strainer means fitted in the second chamber across the passage thereof, means for leading exhaust gases from the first purifier into the second chamber to flow along the passage thereof though the second strainer means, means for feeding clean water or liquid chemical into the second water tank, a second water spray means in the second chamber over the second strainer means for spraying water or liquid chemical downwardly along the passage in the second chamber, means for supplying the water from the second water tank to the second water spray means, means provided in the bottom of the second water tank for draining and means in the top of the second water tank for discharging the exhaust gases into an open air; and

a blower means for feeding fresh air in mixture with the exhaust gases from the first purifier into the second purifier.

4,943,307

PLANT-PROTECTIVE PESTICIDAL COMPOSITION

Tamaás Detre, Nagymaros; Sándor Ángyán, Budapest; László Pap, Budapest; András Szego, Budapest; Zoltán Karádi, Budapest; Klára Bertus née Bende, Szodliget, and Katalin Mármarosi née Kellner, Biatorbágy, all of Hungary, assignors to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Jul. 15, 1988, Ser. No. 220,018

Claims priority, application Hungary, Jul. 16, 1987, 22513245/87

Int. Cl.[5] A01N *25/02, 43/00;* **C07C** *65/12, 211/30*

U.S. Cl. 71—3 **10 Claims**

1. A plant-protective pesticidal solution containing 2.5 to 40% by weight of at least one water-insoluble plant-protective pesticidal ingredient, 20 to 71.5% by weight of dimethyl formamide and/or dimethyl sulfoxide, and/or acetone as water-miscible solvent, 10 to 71.5% by weight of furfural and/or furfuryl alcohol as partially water-miscible solvent, 1 to 15% by weight of anionic and/or nonionic surface active agents and macromolecules, wherein said plant-protective pesticidal solution upon addition to water being capable to form a suspension containing 0.2 to 10% by weight of said water-insoluble plant protective pesticidal ingredient having a particle size of 0.1 to 50 microns.

4,943,308

METHOD OF PRODUCING FERTILIZER GRANULES CONTAINING UREA AND AMMONIUM SULPHATE

Luc A. Vanmarcke, Lembeke, Belgium, and Walter E. Cardon, Sas van Gent, Netherlands, assignors to Hydro Agri Sluiskil B.V., Sluiskil, Netherlands

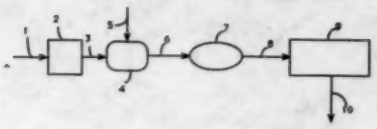
Continuation-in-part of Ser. No. 227,701, Aug. 3, 1988, abandoned, which is a continuation of Ser. No. 917,165, Oct. 9, 1986, abandoned. This application Dec. 28, 1988, Ser. No. 291,310

Claims priority, application Netherlands, Oct. 17, 1985, 8502838

Int. Cl.[5] C05C *3/00, 9/00*

U.S. Cl. 71—29 **6 Claims**

1. A method of producing fertilizer granules containing urea and ammonium sulphate with 15–30 wt.% of ammonium sulphate calculated on the amount of urea and ammonium sulphate by granulating a mixture containing urea, ammonium sulphate and water, characterized in that the ammonium sulphate is completely dissolved in an aqueous urea solution with a urea concentration of 75–85% by weight, the resulting solution is thickened to a dry content of 92–97% by weight, with a granulation additive for the urea being added in any stage of



the treatment, following which the thickened solution is granulated in a fluidized bed of urea and ammonium sulphate containing nuclei.

4,943,309

METHOD OF DEFOLEATING COTTON PLANTS EMPLOYING 3-CARBONYLPHENYL URACIL DERIVATIVES

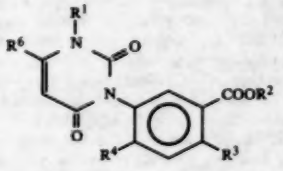
Allyn R. Bell, Cheshire, Conn., assignor to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Sep. 6, 1988, Ser. No. 240,991

Int. Cl.[5] A01N *43/16, 43/18, 43/54, 43/48*

U.S. Cl. 71—74 **3 Claims**

1. A method of defoliating cotton plants, which method comprises applyiong to such plants a plant defoliatingly effective amount of a compound having the structural formula:



wherein:

R^1 is hydrogen or C_1–C_3 alkyl;

R^2 is selected from the group consisting of hydrogen, C_1–C_6 alkyl, C_2–C_4 alkenyl and C_2–C_6 alkoxyalkyl;

R^3 is chloro or fluoro;

R^4 is selected from the group consisting of hydrogen, chloro and fluoro; and

R^6 is trifluoromethyl;

or agriculturally acceptable salts thereof.

4,943,310

CYCLOHEXENECARBOXYLIC ACID DERIVATIVES AS PLANT GROWTH REGULANTS

Alfred Angermann; Helga Franke, and Gerhard Johann, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

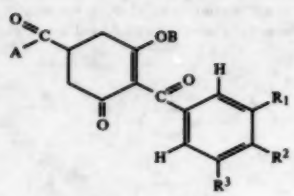
Filed Dec. 16, 1988, Ser. No. 285,821

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3743695

Int. Cl.[5] A01N *43/00;* **C07C** *87/30;* **C07D** *265/32*

U.S. Cl. 71—88 **15 Claims**

1. 4-Benzoyl-3-hydroxy-5-oxo-3-cyclohexenecarboxylic acid derivative of formula I



(I)

in which

A is OR^4 or OM,

B is hydrogen or a cation of the type M,

M is a cation from the group of lithium, sodium and potassium,

R^1, R^2 and R^3 independently of one another are hydrogen, halogen, or nitro, or a C_1–C_6-alkyl or C_1–C_{10}-alkoxy group, which groups are optionally substituted by at least one halogen, sulphinyl or C_1–C_4-alkylsulphonyl, or are C_1–C_{10}-alkylthio, or C_1–C_4-alkylsulphonyl,

R^4 is hydrogen or a C_1–C_{18}-alkyl group, which groups are optionally substituted by halogen or cyano or optionally interrupted one or more times by oxygen or sulphur, a C_3–C_6-cycloalkyl or C_3–C_6-cycloalkyl-C_1–C_2-alkyl group, which groups are optionally substituted by halogen or cyano, a phenyl or benzyl group, which groups are optionally substituted, one or more times, by halogen, cyano, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, nitro or trifluoromethyl, or is a 5 or 6-membered heterocyclic group,

R^5 and R^6 are the same or different and are hydrogen, or a C_1–C_{18}-alkyl, C_2–C_{12}-alkenyl, C_2–C_{12}-alkynyl group, which groups are optionally substituted by halogen or cyano or optionally interrupted one or more times by oxygen or sulphur, a phenyl or benzyl group, which groups are optionally substituted, one or more times, by C_1–C_6-alkyl, halogen, C_1–C_6-alkoxy or nitro, or

R^5 and R^6 together with the adjacent nitrogen atom form a morpholino, piperidino or pyrrolidino group, and

R^7, R^8, R^9 and R^{10} are the same or different and are hydrogen, or a C_1–C_6-alkyl, phenyl, benzyl or phenylethyl group, which groups are optionally substituted by halogen, hydroxy or C_1–C_6-alkoxy.

3. A method of regulating the growth of plants which comprises applying to the plants or their locus an effective regulating amount of a compound according to claim 1.

4,943,311

AZOLE DERIVATIVES OF SPIROHETEROCYCLES

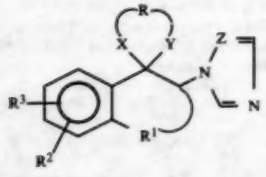
Hoi K. Lai, Guelph, Canada; Robert A. Davis, and Allen R. Blem, both of Cheshire, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn. and Uniroyal Chemical Ltd/Ltee, Don Mills, Canada

Filed May 9, 1988, Ser. No. 191,932

Int. Cl.[5] **A01N** *43/28*; **C07D** *405/14, 409/14, 411/14*

U.S. Cl. 71—90 **8 Claims**

1. A compound having the structural formula



where

R is C_2–C_8 alkylene having 2 to 4 carbon atoms linking X and Y;

R^1 is C_1–C_6 oxyalkylene or C_1–C_6 thioalkylene;

R^2 and R^3 are the same or different and are hydrogen, halogen, C_1–C_8 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, C_1–C_6 alkylsulfonyl, phenyl, substituted phenyl, phenoxy, substituted phenoxy, cyano, nitro, $—OCOR_4$, $—COOR^5$, $—CH_mQ_{3-m}$ or $—OCH_mQ_{3-m}$;

R^4 is C_1–C_4 alkyl;

R^5 is hydrogen or C_1–C_4 alkyl;

Q is halogen;

X and Y are the same or different and are oxygen, sulfur, sulfinyl, sulfonyl or if one is NH, the other is sulfur;

Z is nitrogen or CH; and

m is 1, 2 or 3;

or physiologically acceptable salts thereof.

7. A fungicidal or plant growth regulant composition comprising a fungicidally or plant growth regulant effective amount of the compound of claim 1 and a carrier therefor.

4,943,312

HERBICIDAL THIAZOLE DERIVATIVES

James V. Hay, Newark, Del., and Anthony D. Wolf, Elkton, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 479,363, Apr. 4, 1983, abandoned. This application May 14, 1984, Ser. No. 609,695

Int. Cl.[5] **C07D** *417/12*; **A01N** *47/36*

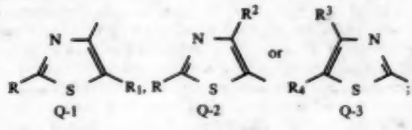
U.S. Cl. 71—90 **12 Claims**

1. A compound of the formula:

$$QSO_2NHCONHA$$

where

Q is



Q-1 Q-2 Q-3

R is H, C_1–C_3 alkyl or $CH_3C(O)NH$;

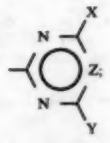
R_1 is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, or C_1–C_3 alkoxycarbonyl;

R_2 is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkoxycarbonyl, NO_2, Cl, Br or CF_3;

R_3 is H, Cl or CH_3;

R_4 is H, Cl or CH_3;

A is



X is CH_3, OCH_3, OCF_2H, OC_2H_5 or CH_2OCH_3;

Y is CH_3, OCH_3, or OCF_2H; and

Z is CH or;

provided that (i) R_3 and R_4 are not simultaneously Cl, and (ii) when either X or Y is OCF_2H, then Z is CH; and agriculturally suitable salts thereof.

4,943,314

PYRIDINE-3-CARBOXAMIDE DERIVATIVES HAVING PLANT GROWTH INHIBITING ACTIVITY

Yukihisa Goto; Kazuhisa Masamoto; Hiroshi Yagihara, all of Himeji; Yasuo Morishima, Kobe, and Hirokazu Osabe, Himeji, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 922,038, Oct. 20, 1986, Pat. No. 4,844,732. This application Mar. 3, 1989, Ser. No. 318,818

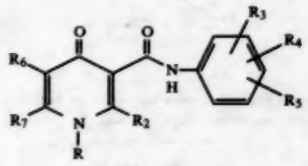
Claims priority, application Japan, Oct. 24, 1985, 60-238524

The portion of the term of this patent subsequent to Feb. 12, 2005, has been disclaimed.

Int. Cl.[5] C07D *211/84, 211/86, 211/90*; A01N *43/40*

U.S. Cl. 71—94 12 Claims

1. A compound of the formula:



wherein:

R is a group —$(CH_2)n$—R_1, wherein n is an integer from 1 to 3 and R_1 is hydrogen, hydroxy, lower alkoxy, mercapto, lower alkylthio, amino, di-lower alkylamino, C_{3-11} alkyl, lower alkenyl, lower alkynyl, C_{3-6} cycloalkyl or phenyl substituted by halogen, lower alkyl or lower alkoxy;

R_2 and R_7 are different and may each be hydrogen, C_{1-11} alkyl, lower alkenyl, lower alkynyl, cycloalkyl, phenyl, or phenyl substituted by halogen, lower alkyl, lower alkoxy, trihalomethyl, nitro or cyano;

R_3, R_4 and R_5 are, independently, hydrogen, halogen, cyano, nitro, amino, lower alkyl, lower haloalkyl, hydroxy, lower alkoxy, phenyloxy, carboxy or lower alkoxycarbonyl;

R_6 is hydrogen or halogen; and addition salts thereof with acids or bases.

12. A plant growth inhibitor composition wherein the active component consists essentially of an effective amount of the compound of claim 1 in admixture with an inert carrier.

4,943,315

AGENTS FOR REDUCING TRANSPIRATION OF PLANTS

Guenter Schulz, Ludwigshafen; Juergen Schubert; Hubert Sauter, both of Mannheim; Klaus Grosmann, and Johann Jung, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

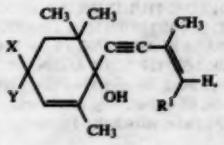
Filed Feb. 6, 1989, Ser. No. 306,560

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1988, 3803667

Int. Cl.[5] A01N *47/30, 31/00, 43/00*

U.S. Cl. 71—120 11 Claims

1. An agent for reducing transpiration in plants and for avoiding impairment to plants caused by heat and dry stress, comprising a synergistic mixture of at least one acetylene compound of the general formula I



(I)

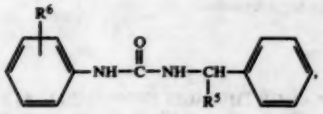
where the substitutents have the following meanings

R_1 is CH(OR^2) (OR^3) or CHXY,

wherein X and Y together are C_2- or C_3-alkylenedioxy which is unsubstituted or mono- or disubstituted by methyl or ethyl,

R^2, R^3 is C_1–C_4-alkyl

and at least one phenylbenzylurea of the general formula II



(II)

where the substituents have the following meanings

R^5 is hydrogen or methyl and R^6 is hydrogen, methyl or halogen, wherein an excess of compound II is employed.

4,943,316

RELATING TO THE FORMATION OF METAL ALKOXIDES AND METAL POWDERS BY THE USE OF MICROWAVE RADIATION

Reginald M. Taylor, Hawthorn, Australia, assignor to Hallsworth & Associates Pty. Limited, Keswick, Australia

PCT No. PCT/AU87/00443, § 371 Date Aug. 30, 1988, § 102(e) Date Aug. 30, 1988, PCT Pub. No. WO88/05035, PCT Pub. Date Jul. 14, 1988

PCT Filed Dec. 24, 1987, Ser. No. 266,634

Claims priority, application Australia, Dec. 30, 1986, PH9697

Int. Cl.[5] B22F *9/16*

U.S. Cl. 75—0.5 A 19 Claims

1. A process for thermally decomposing a metallic compound using microwave energy, comprising:

(a) providing a metallic compound selected from the group consisting of a metallic oxide, metallic hydroxide, metallic oxydroxide and metallic oxy-salt, that is capable of thermally decomposing to form a fine-grained metal or metal alkoxide at a temperature below the lower of the boiling point and decomposition temperature of a given di-, tri- or polyhydric alochol;

(b) dissolving and/or suspending said metallic compound in an excess of said given di-, tri- or polyhydric alcohol;

(c) subjecting the solution and/or suspension thus formed to irradiation by microwave energy, whereby said metallic compound is reacted to form a fine-grained metal or metal alkoxide.

4,943,317

AGENT FOR DESULPHURIZING IRON MELTS, A PROCESS FOR THE PRODUCTION THEREOF AND A PROCESS FOR DESULPHURIZING IRON MELTS WITH THE USE OF SAID AGENT

Helmut Lischka, Trostberg; Werner Gmöhling, Hufschlag, and Gerd Hieber, Seeon, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Sep. 14, 1989, Ser. No. 407,422

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1988, 3831831

Int. Cl.[5] C21C *7/02*

U.S. Cl. 75—312 **14 Claims**

1. A composition for desulfurizing an iron melt, said composition consisting essentially of a mixture of discrete coated particles of calcium carbide and of a metallic element, where the ranges of the bulk densities and grain sizes of said particles in said mixture are substantially the same.

4,943,318

REMOVAL OF THORIUM FROM RAFFINATE

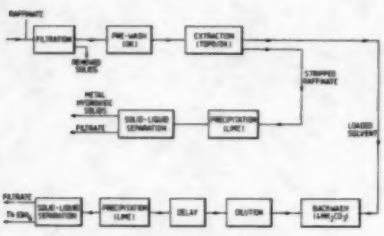
Alan Rushton, Preston, United Kingdom, assignor to British Nuclear Fuels PLC, Warrington, England

Filed Dec. 27, 1989, Ser. No. 458,088

Claims priority, application United Kingdom, Feb. 27, 1989, 8904433

Int. Cl.[5] C22B *3/00*

U.S. Cl. 423—10 **13 Claims**



1. A solvent extraction process for the removal of thorium from raffinate effluent, the process comprising pre-washing the raffinate effluent with odourless kerosene, followed by stripping the pre-washed raffinate effluent by solvent extraction with tri-n-octylphosphine oxide/odourless kerosene solvent, the loaded solvent therefrom then being back-washed with an alkaline solution and the thorium therein precipitated with an alkaline hydroxide slurry.

4,943,319

PROCESS FOR PRODUCING HIGHLY FUNCTIONAL COMPOSITE MATERIAL AND COMPOSITE MATERIAL OBTAINED THEREBY

Masahiro Yanagawa; Mutsumi Abe; Kenichi Aota, all of Kobe, and Takashi Motoda, Hyogo, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

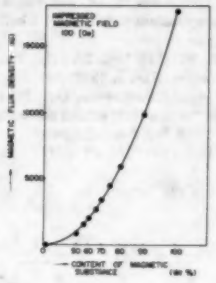
Filed Dec. 30, 1988, Ser. No. 292,312

Claims priority, application Japan, May 18, 1988, 63-121564; Aug. 26, 1988, 63-212910

Int. Cl.[5] B22F *1/00*

U.S. Cl. 75—229 **7 Claims**

1. A process for producing a composite molding product which comprises: forming a mixture of ferromagnetic metal with a powder of matrix metal selected from the group consisting of aluminum, copper and alloys thereof; charging the mixture directly into a molding dye; applying cold compact molding under pressure of greater than 5 T/cm^2 of facial pressure



and applying a heat treatment for diffusion bonding at a temperature between about 300° C. to 800° C.

4,943,320

VAPOR PHASE REDISTRIBUTION IN MULTI-COMPONENT SYSTEMS

Alexander Pechnik, Woodland Hills, and M. Dean Matthews, Saratoga, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 15, 1988, Ser. No. 285,070

Int. Cl.[5] C22C *29/12*

U.S. Cl. 75—235 **28 Claims**

1. A process for making a product of at least two materials, comprising a first material and a second material, comprising the steps of:

(a) preparing a mixture of said materials;

(b) isolating said mixture from the environment; and

(c) exposing said mixture to a temperature sufficient to enable at least said first material to redistribute within said mixture by means of vaporization and subsequent condensation.

4,943,321

SYNCHRONIZER RING IN SPEED VARIATOR MADE OF IRON-BASE SINTERED ALLOY

Hidetoshi Akutsu, Saitama, Japan, assignor to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 164,534

Claims priority, application Japan, Mar. 13, 1987, 62-58415; Mar. 13, 1987, 62-58416; Mar. 13, 1987, 62-58417; Mar. 13, 1987, 62-58418; Mar. 17, 1987, 62-61783; Mar. 17, 1987, 62-61784

Int. Cl.[5] C22C *29/00*

U.S. Cl. 75—243 **26 Claims**

1. A synchronizer ring having at least one surface to make sliding contact with a mating surface made of an sintered iron-base alloy having high strength, wear resistance and good compatibility with the mating surface, said sintered alloy consisting essentially of 0.1–0.9% C (all percents being on a weight

basis), and at least one element selected from the group consisting of 0–6% of at least one of Mn, Cr and Mo, 0–6% of at least one of Ni and Cu, and 0–0.5% B, the balance being Fe and incidental impurities (Si, S and P as incidental impurities being present in a total amount not exceeding 0.5%), said sintered iron-base alloy having a porosity of 0.05–5 vol %.

4,943,322

SPHERICAL TITANIUM BASED POWDER PARTICLES

Preston B. Kemp, Jr., Athens, and Walter A. Johnson, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 904,317, Sep. 8, 1986, Pat. No. 4,783,216. This application Nov. 16, 1987, Ser. No. 121,421

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[5] **B22F** *9/02*; **C22C** *14/00*

U.S. Cl. 420—417 **1 Claim**

1. A powdered material consisting essentially of spherical particles of a titanium base material, said powdered material being essentially free of elliptical shaped material and being essentially free of elongated particles, said powdered material having a particle size of less than about 50 micrometers and produced by the process comprising

(a) mechanically reducing the size of a titanium based material to produce a finer powder;

(b) entraining said finer powder in a carrier gas and passing said powder through a high temperature zone at a temperature above the melting point of said finer powder, said temperature being from about 5500° C. to about 17,000° C., said temperature being created by a plasma jet, to melt at least about 50% by weight of said finer powder to form essentially spherical particles of said melted portion and

(c) rapidly and directly resolidifying the resulting high temperature treated material while said material is in flight.

4,943,323

PROCESSING ADDITIVES FOR BLENDED CEMENTS

Ellis M. Gartner, Silver Spring; David F. Myers, Columbia, and James M. Gaidis, Ellicott City, all of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Oct. 6, 1989, Ser. No. 418,437

Int. Cl.[5] **C04B** *24/00*

U.S. Cl. 106—808 **25 Claims**

1. A strength enhanced blended cement comprising a mixture of clinker having at least 4% C_4AF, gypsum, 5% to 60% by weight filler or clinker substitute together with an effective amount of a strength enhancing additive to increase the 7 and 28-day strength, wherein the additive comprises triisopropanolamine.

4,943,324

HIGH PERFORMANCE PAPER FILLER AND METHOD OF PRODUCING SAME

Wayne M. Bundy, Lebanon; John A. Manasso, Belle Mead, and Joseph P. Berberich, Barnegat, all of N.J., assignors to Georgia Kaolin Company, Inc., Union, N.J.

Filed May 23, 1988, Ser. No. 197,357

Int. Cl.[5] **C09C** *1/28, 3/06*

U.S. Cl. 106—486 **20 Claims**

1. A method for producing a high bulking uncalcined kaolin pigment exhibiting improved opacifying properties when incorporated as a filler in paper, said method comprising:

a. selecting a base kaolin clay to be processed, the selected base kaolin clay being a hydrated kaolin clay having a brightness of at least about 89;

b. dispersing the selected base kaolin clay in an aqueous suspension of a water soluble dispersing agent to form an aqueous clay slurry;

c. delaminating the selected base kaolin clay in said aqueous clay slurry;

d. removing a portion of the colloidal fines in said aqueous clay slurry by partially defining the delaminated kaolin clay in said aqueous clay slurry by separating the aqueous clay slurry into a first fraction and a second fraction, the second fraction having an average particle size finer than the first fraction, and discarding a first portion of the second fraction and admixing the remaining portion of the second fraction with the first fraction, said first portion of the second fraction comprising from about 25% to about 50% by weight of the second fraction of said aqueous clay slurry;

e. after said delamination and defining steps, surface treating the kaolin clay particles by admixing into said aqueous clay slurry a member from the group consisting of a water soluble amine, aluminum sulfate, and mixtures thereof while agitating said aqueous clay slurry;

f. after sufficient agitation, adjusting the pH of said aqueous clay slurry to about 3.0;

g. treating said aqueous clay slurry at a pH of 3.0 with a water soluble leaching agent;

h. adjusting the pH of said aqueous clay slurry after leaching to about 5.0; and

i. collecting the delaminated, defined and treated kaolin clay from said aqueous clay slurry as a product filter cake having a colloidal fines content less than about 20% by weight.

4,943,325

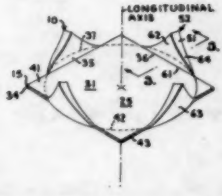
REFLECTOR ASSEMBLY

Sheldon L. Levy, Prairie Village, Kans., assignor to Black & Veatch, Engineers-Architects, Kansas City, Mo.

Filed Oct. 19, 1988, Ser. No. 260,231

Int. Cl.[5] **H01L** *31/04*

U.S. Cl. 136—259 **20 Claims**



1. In combination with a primary light concentration having an axis and providing a light concentration and a generally planar receiver including a first portion located directly within said light concentration and a second portion located outside of said direct light concentration, the improvement of a secondary reflector which comprises:

(a) reflector means positioned within said light concentration and oriented to deflect a portion of said light concentration outwardly to the second portion of said receiver outside of said direct light concentration, whereby said portions of said receiver both within and outside of said direct light concentration are illuminated.

4,943,326

ORNAMENT AND METHOD OF MANUFACTURING THE SAME

Kazuhiro Ozawa, Yokohama; Etsuo Nakajima, Nagoya, and Isao Yamaguchi, Mie, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo and Yamaguchi Pearl, Co., Ltd., Mie, both of, Japan

Filed Oct. 20, 1988, Ser. No. 260,030

Claims priority, application Japan, Oct. 23, 1987, 62-267959

Int. Cl.[5] C22F *1/10*

U.S. Cl. 148—11.5 N **5 Claims**

1. An ornament comprising: a superelastic Austenite metallic alloy wire which has an Af point not higher than about 15° C., said wire overlapping on the ends forming a wound ring.

4,943,327

PROCEDURE TO FORM A NON-WOVEN CLOTH MADE OF SYNTHETIC FILAMENTS

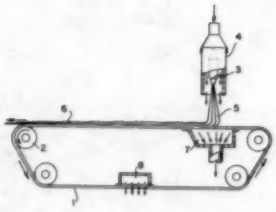
Maurice Gauthier, Hiersac, France, assignor to Asten Group, Inc., Charleston, S.C.

Filed Feb. 26, 1988, Ser. No. 160,917

Claims priority, application France, Feb. 27, 1987, 87 02674

Int. Cl.[5] B32B *31/30*

U.S. Cl. 156—62.6 **5 Claims**



1. An improved procedure for forming a non-woven cloth (**6**) of synthetic filaments (**5**), having a melting point t_2 by extruding, stretching, cooling and projecting said synthetic filaments (**5**) onto a moving plastic forming fabric (**1**), the improvement characterized by providing a plastic forming fabric (**1**) having a melting point t_1 which is at least 80° above the melting point t_2 and cleaning the plastic forming fabric (**1**) by passing hot fluid, having a temperature t which is approximately

$$\frac{t_1 + t_2}{2},$$

over the plastic forming fabric (**1**).

4,943,328

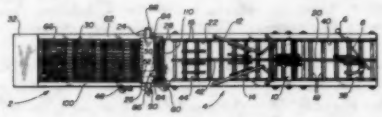
METHOD AND APPARATUS FOR SELECTING WOOD STOCK TO FORM PANELS OF PREDETERMINED SIZE

Bradley S. Quick, Rhinebeck, N.Y., assignor to James L. Taylor Manufacturing Company Inc., Poughkeepsie, N.Y.

Filed Feb. 18, 1988, Ser. No. 157,409

Int. Cl.[5] B65G *47/19*

U.S. Cl. 156—64 **13 Claims**



1. Apparatus for selecting at least two workpieces from among a number of work pieces to be combined together for further processing into a panel comprising:

infeed means for supporting and advancing a plurality of workpieces from a first station to a second station;

means at said second station for inspecting said plurality of workpieces and developing electrical signals indicative of the height of each of said workpieces;

means connected to receive said electrical signals for comparing said electrical signals with predetermined panel dimension requirements and for generating output signals as a result of said comparison;

selection means mounted in proximity to said workpieces and coupled to receive said output signals for selecting at least two of said workpieces to form a panel in accordance with said dimension requirements; and

conveying means mounted in proximity to said selection means for conveying said selected workpieces for panel formation.

4,943,329

METHOD FOR MANUFACTURING TIES FROM INTERWOVEN HARP AND WEFT TAPES

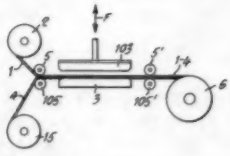
Carlo Fini, Bologna, Italy, assignor to A. Testoni S.p.A., Bologna, Italy

Filed Sep. 12, 1988, Ser. No. 242,769

Claims priority, application Italy, Sep. 10, 1987, 12536 A/87

Int. Cl.[5] A41D *25/00*; B32B *31/18, 31/20*

U.S. Cl. 156—88 **6 Claims**



1. A method of manufacturing ties comprising the steps of

(a) forming a piece of composite fabric from interwoven warp and weft tapes each having a width of up to 10 mm, at least one of said weft tapes and said warp tapes having a visible satiny surface selectively appearing glossy and opaque, depending on incidence of light thereon;

(b) placing said piece of composite fabric on a piece of thin, flexible base web;

(c) bonding said composite fabric to said base web by means of a hot-melt adhesive;

(d) cutting laterally adjacent tie portions from said piece of composite fabric, said tie portions having a shape and width such that said tie portions are adapted to the attached to one another in proper succession to form a tie;

(e) providing said portions with peripheral selvedge seams

prior to step (d), at least along tie portion cutting lines in said fabric; and

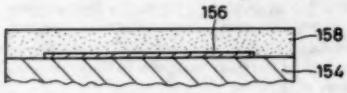
(f) sewing said cut tie portions together.

4,943,330

METHOD OF MANUFACTURING AN ELECTROCHEMICAL DEVICE

Atsushi Iino, Nagoya, and Nobuhide Kato, Aichi, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Division of Ser. No. 26,433, Mar. 16, 1987, Pat. No. 4,824,548.
This application Feb. 17, 1989, Ser. No. 311,825
Claims priority, application Japan, Mar. 17, 1986, 61-58875
Int. Cl.[5] G01N *27/58*
U.S. Cl. 156—89 **2 Claims**



1. A method of producing an electrochemical sensing element, comprising the steps of:

preparing an unfired zirconia sheet, which is fired into a dense zirconia body, by a tape-forming method;

forming an unfired electrode layer, which is fired into an electrode, on one of opposite major surfaces of said unfired zirconia sheet;

preparing an unfired zirconia protective sheet which consists essentially of fully stabilized zirconia and partially stabilized zirconia and which is fired into a porous protective layer by a tape-forming method;

preparing an unfired laminar structure consisting of said unfired zirconia sheet, said unfired electrode layer and said unfired zirconia protective sheet, said unfired electrode layer being interposed between said unfired zirconia sheet and said unfired zirconia protective sheet to form said unfired laminar structure; and

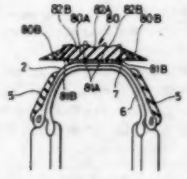
firing said unfired laminar structure into the electrochemical sensing element.

4,943,331

METHOD OF MANUFACTURING PNEUMATIC TIRE

Misao Kawabata, Tokorazawa, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Nov. 16, 1988, Ser. No. 271,785
Claims priority, application Japan, Nov. 17, 1987, 62-288289
Int. Cl.[5] B60C *9/18*; B29D *30/20*
U.S. Cl. 156—129 **12 Claims**



1. A method of manufacturing a pneumatic tire, which comprises the following steps of:

(a) winding a carcass ply around a cylindrical former;

(b) adhering a pair of bead rings and a pair of bead filler rubbers on both side ends of the carcass ply;

(c) adhering a pair of side rubbers on the bead filler rubbers, while leaving a space at a central portion of the carcass ply;

(d) expanding with a bladder press the carcass ply on which bead rings, bead filler rubbers and said rubbers are arranged into a toroidal shape;

(e) adhering a belt layer on the carcass ply;

(f) preparing a tread rubber member whose outer surface is formed into a corrugated profile along a tire axial direction, in cross section, so that radially convex portions thereof are located under radially inward projections on the interior surface of a mold for vulcanization and radially concave portions thereof are located under flat portions of the interior surface of said mold for vulcanization when a green tire is placed in said mold;

(g) adhering the tread rubber member on to the belt layer;

(h) adhering both side ends of the tread rubber member to the side rubbers, respectively, with a stitching roller to obtain a green tire; and

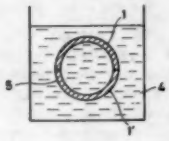
(i) placing the green tire into said mold for vulcanization, and aligning said radially convex portions of the corrugated profile of the tread rubber member with projections formed in a mold for forming circumferential grooves of a tire tread whereby radially concave belt layer portions are formed under the tire circumferential grooves and radially convex belt layer portions are formed under the tire projections before the tire is inflated.

4,943,332

METHOD FOR PRODUCTION OF LIQUID CENTER BALL FOR GOLF BALL

Akihiro Sakaguchi, Kanagawa; Noriyuki Kaneko; Toshio Saruta, both of Tokyo, and Ryotaro Sawano, Kanagawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jan. 13, 1989, Ser. No. 297,225
Claims priority, application Japan, Mar. 7, 1988, 63-53125
Int. Cl.[5] A63B *37/08*; B29C *65/00*
U.S. Cl. 156—146 **11 Claims**



1. A method of producing a liquid center ball for a golf ball, comprising,

preparing a pair of bag rubber hemispheres,

applying an adhesive onto at least one edge surface of the bag rubber hemispheres and providing a substance into at least one of the bag rubber hemispheres, said substance being suspendable in a liquid material and selected from at least one of an inorganic compound, a clay mineral, a metal powder and a heavy ore powder,

dipping the bag rubber hemispheres with the substance therein into the liquid material,

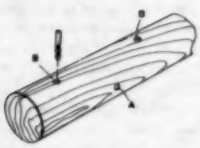
connecting the bag rubber hemispheres together in the liquid material to form a sphere so that the liquid material and the substance are filled therein, and

vulcanizing the sphere so that the bag rubber hemispheres firmly stick together and the substance in the sphere is uniformly dispersed and suspended in the liquid material.

4,943,333
MANUFACTURING PROCESS FOR WOODEN CUES TO PROVIDE PERMANENT STRAIGHTNESS

Jung-Shih Chang, 28, Lane 25, Li-Min Str., Tali, Taichung 41215, Taiwan

Filed Jun. 6, 1988, Ser. No. 202,813
Claims priority, application Taiwan, May 6, 1988, 77101941
Int. Cl.[5] B29C *43/18, 67/14*
U.S. Cl. 156—153 **9 Claims**



1. A method for manufacturing a wooden cue comprising the steps of:

turning a wooden stick to obtain a wooden preliminary cue having a first predetermined diameter and having a longitudinal axis;

drilling a plurality of holes into the preliminary cue, said holes being nonparallel to the longitudinal axis of the preliminary cue, said holes destroying the composition of fibers in the wooden preliminary cue to thereby reduce reciprocal influence of the fibers to aid in maintaining straightness in the cue over an extended period of time;

coating the preliminary cue with an adhesive, said adhesive generally filling the plurality of holes in the preliminary cue;

covering the cue with a covering material to form a cue having a second predetermined diameter, said second diameter being greater than said first diameter, said covering material being one of a resin dipped cloth and a heat-resistant covering material;

pressing and drying the cue covered with the covering material;

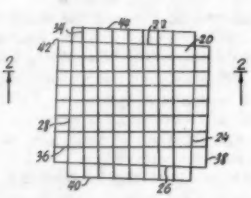
cutting ends of the cue covered with the covering material to obtain a cue with a predetermined length; and

attaching a stopper to each end of the cut cue to form a water-proof wooden cue, said wooden cue generally maintaining the straightness thereof.

4,943,334
METHOD FOR MAKING REINFORCED PLASTIC LAMINATES FOR USE IN THE PRODUCTION OF CIRCUIT BOARDS

Jonas Medney, Rockville Center, and Fred E. Klimpl, Great Neck, both of N.Y., assignors to Compositech Ltd., Hauppauge, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,863
Int. Cl.[5] B65H *81/00*; H05K *1/03*
U.S. Cl. 156—174 **73 Claims**



1. In a method for making a printed circuit board of a set of filament sections embedded in and bonded to a continuous phase of settable matrix material, the steps comprising, prior to setting or curing of such settable matrix material which holds the entire set of filament sections in fixed spatial relationship, forming at least one set of filament sections as a plurality of superposed layers of filament sections with the filament sections in each layer being arranged generally in the same direction and with the direction of the filament sections in at least one layer in such set being arranged at an angle to the direction of the filament sections in other layers in such set; and arranging said layers in mirror image relationship relative to a plane of symmetry parallel to the layers of the set, all of the filament sections aligned generally in the same direction being under the same tension; said filament sections being held on a form in fixed spatial relationship.

4,943,335
METHOD OF MANUFACTURING A PROFILED STRIP WITH SMOOTH REINFORCING INSERT

Franz Schröder, Hückswagen, and Gerd Strutz, Schwelm, both of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Division of Ser. No. 166,991, Mar. 11, 1988, Pat. No. 4,835,031. This application Dec. 15, 1988, Ser. No. 285,195
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1987, 3708889
Int. Cl.[5] B29C *47/02*
U.S. Cl. 156—244.18 **9 Claims**

1. A method of producing a profiled strip, wherein the profiled strip is comprised of a non-metallic covering, and the profiled strip has at least one incorporated flexurally-elastic reinforcing insert in the form of a metal strip that is thin in thickness and that is deformable for profiling, the method comprising:

stamp cutting the metal insert strip for defining a continuous uncut web and for defining a plurality of rungs in the metal insert strip extending laterally away from the web, the stamp cutting defining the rungs alongside of and adjacent each other, without spacing between adjacent rungs which are stamp cut;

smoothing the metal insert strip such that all the rungs are in the plane of the metal insert strip and adjacent rungs are alongside of each other and are without separation along the length of the rungs;

deforming the metal insert strip for defining a predetermined profiled cross-section for the metal insert strip; and

applying a coating of a non-metallic material covering, to the metal insert strip for completing the profiled strip.

4,943,336
APPARATUS AND METHOD FOR FABRICATING COMPOSITE PANELS FOR USE IN CONCRETE BUILDINGS

Ernest Csont, 4133 Quando Dr., Belle Isle, Fla. 32812

Filed Aug. 18, 1988, Ser. No. 212,014
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—280 **13 Claims**

5. A method for fabricating a composite concrete panel in a fixture having a first row of spaced apart staves attached to a base member and a second row of spaced apart staves attached

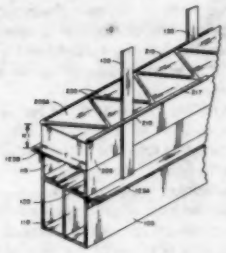
to said base member, said first row being substantially parallel with said second row, an insulative block receiving region being formed above said base member and between said first and second rows, said method comprising the steps of:

placing a block of insulative material in said block receiving region;

situating a truss in the block receiving region of said fixture above said block, said truss having parallel stringer members connected together by a plurality of cross members, the stringer members of said truss being situated outside of said first and second row of staves;

applying adhesive to said block;

repeating said placing, situating and applying steps until nearly the desired panel height is achieved;



placing a block of insulative material in said block receiving region to position the uppermost block of said panel and form the top of said panel, the bottom of said panel thus being formed at the lowermost block thereof, the panel thus formed including first and second opposed major surfaces; and

mounting first and second wire mesh sheets on the first and second major surfaces of said panel, respectively, one of said first and second wire mesh sheets being substantially flush with the bottom of said panel and extending beyond the top of said panel to permit overlap with other panels, said first and second wire mesh sheets being mounted to the stringer members of the trusses in said panel.

4,943,337

APPARATUS FOR ATTACHING A LABEL TO A SURFACE OF A PACKAGE

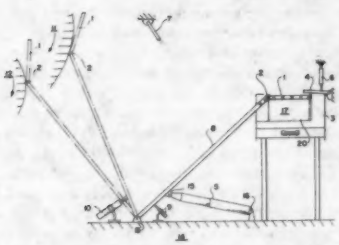
Pekka Turkki, Helsinki, Finland, assignor to Valmet Paper Machinery, Inc., Helsinki, Finland

Filed Nov. 25, 1987, Ser. No. 126,265

Claims priority, application Finland, Nov. 28, 1986, 864853

Int. Cl.[5] B65C *9/02, 9/14, 9/18, 9/30*

U.S. Cl. 156—384 **8 Claims**



1. An apparatus for attaching at least one of a plurality of labels to a surface of a package comprising:

a base;

a printer mounted on the base for printing the labels on a perforated and adhesive precoated label web;

means for activating adhesive on a surface of the label;

a swing arm pivotally mounted to said base;

a suction plate connected to a distal end of the swing arm at a predetermined obtuse angle joint with the swing arm, said label printed on the label web by the printer being introduced and latched onto said plate by vacuum;

means for rotating the swing arm to move the suction plate along a path between a position to receive the label thereon and a position to transfer the label from the suction plate to the surface of the package;

shearing means for separating the label at least partially from the label web;

a pressure roller positioned at the angle joint between the swing arm and the suction plate and onto which the label web can be aligned while the suction plate is at the position to receive the label; and

means for moving the package at the position to transfer the label from the suction plate to the package, so as to form a nip between the surface of the moving package and the pressure roller for effecting said transfer of said one of a plurality of labels from said suction plate to the package.

4,943,338

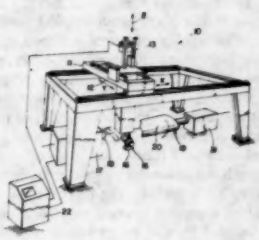
MULTI-TOW FIBER PLACEMENT MACHINE WITH FULL BAND WIDTH CLAMP, CUT, AND RESTART CAPABILITY

Jerry D. Wisbey, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Sep. 26, 1988, Ser. No. 248,702

Int. Cl.[5] B32B *31/00;* **B65H** *81/00*

U.S. Cl. 156—433 **7 Claims**



1. An improved head for use in a fiber placement machine having: a machine member for carrying a fiber placement head; an upstream fiber supply source; a downstream work laydown zone; means for providing relative movement between the machine member and the work laydown zone; and, wherein fiber tows run from the upstream source to the downstream laydown zone in accordance with relative control of the head with respect to the work laydown zone, wherein the improved head comprises:

bracket means affixed to said machine member;

presser means movably mounted to said bracket means for impressing said fiber tows in said work laydown zone;

fiber guide and spacing means movably mounted to said bracket means, said fiber guide and spacing means including means for permitting relatively free movement of said fiber tows with respect to said fiber guide and spacing means and means for clamping said fiber tows to said fiber guide and spacing means, and means for maintaining adjacent fiber tows separate from one another while in said fiber guide and spacing means, said means for maintaining being coextensive with said tows at all times of operation of said fiber guide and spacing means; and

drive means for relatively moving said fiber guide and spacing means bidirectionally with respect to said bracket

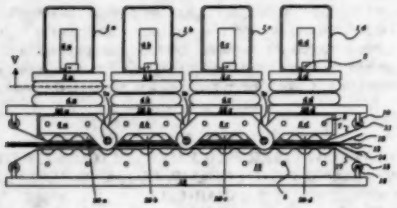
means, between an advanced position proximal said presser means, and a retracted position distal said presser means.

4,943,339

APPARATUS FOR MANUFACTURING CORRUGATED PLYWOOD COMPOSITES

Ethan Ernest, 257 W. 19th St., New York, N.Y. 10011

Division of Ser. No. 40,640, Apr. 27, 1987, Pat. No. 4,816,103.
This application Aug. 31, 1988, Ser. No. 238,409
Int. Cl.[5] B30B *7/04*
U.S. Cl. 156—443 **11 Claims**



1. A sequentially articulated molding apparatus for the fabrication of corrugated wood laminates comprising a frame, a lower mold half mounted on said frame and having an upwardly directed corrugated shaping surface, an upper mold assembly mounted on said frame and having a downwardly directed complemental corrugated shaping surface in opposed relation to said upwardly directed surface, said upper mold assembly being comprised of a plurality of at least three individual rockable mold sections disposed in side by side relation, hinge means interconnecting said mold sections for relative pivotal movement about pivot axes parallel to the longitudinal direction of said corrugations, and linear acting motor means, interposed between said frame and each of said sections and sequentially actuated whereby, upon actuation of the motor means of a given mold section, the respective section is swung pivotally in a first direction toward said lower mold half about a pivot axis defined by the hinged connection between said given section and the next successive adjacent section, and upon actuation of said motor means of said next successive adjacent section said given section is swung toward said lower mold half about the pivot axis between said given section and a prior adjacent section or if the given section is an end section then about its end in a direction opposite to said first direction.

4,943,340

APPARATUS FOR ATTACHING ELASTIC MEMBER TO WEARABLE ARTICLES

Hiroshi Ujimoto, Kawanoe; Hironori Nomura, Iyomishima, and Toshinori Yamamoto, Kawanoe, all of Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Filed Jan. 12, 1989, Ser. No. 297,587
Claims priority, application Japan, Jan. 14, 1988, 63-7345
Int. Cl.[5] B32B *31/10*
U.S. Cl. 156—496 **4 Claims**

1. An apparatus for attaching an elastic member to a wearable article, which apparatus comprises:

a cutting station;

means for feeding a continuous elastic sheet of predetermined width from a supply to the cutting station and continuously applying an adhesive coating on one surface of the elastic sheet except adjacent longitudinal edge portions thereof;

cutting means at the cutting station for successively forming individual elastic members by repeatedly cutting the continuous elastic sheet along a severance axis extending in a transverse direction thereof;

transfer means for the elastic members;

feeding, spacing and stretching means for feeding the successively formed elastic members from the cutting means to the transfer means while spacing the elastic members a predetermined distance apart in the feeding direction thereof and stretching each elastic member to an extended condition in the transverse direction comprising:

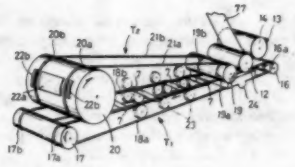
first and second pairs of rollers;

first and second pairs of endless belts mounted around the respective pairs of rollers for driven movement thereby;

the rollers of each pair being spaced apart in the feed direction and located adjacent the cutting means and the transfer means respectively;

means on the rollers to maintain the belts of each pair extending spaced apart in divergent relation as they extend in the feed direction from the cutting means to the transfer means with the belts of the first pair diverging at the same angle as the belts of the second pair;

the first and second pairs of rollers being driven respectively in opposite rotational senses and arranged with respective forwardly driven portions of the belts of the first pair of belts extending in the feed direction aligned with and adjacent forwardly driven portions of the respective belts



of the second pair so that respective belts of the first pair cooperate with respective belts of the second pair to grip between them the ends of the elastic members thereby to feed successive elastic members from the cutting station to the transfer means while progressively stretching the elastic members in the transverse direction during such feeding movement;

means for feeding a continuous web of article precursors in end-to-end relation past the transfer means;

the transfer means comprising:

a roller of the second pair of rollers, which roller is located adjacent the continuous web of article precursors and includes means to receive elastic members released from the belts and releasably to hold such elastic members in extended condition transversely of the continuous web of article precursors and to press the coated surfaces of the elastic members so held successively against the web at predetermined intervals in a longitudinal direction of the continuous web during the feeding of the web thereby to transfer and to attach each elastic member to the continuous web; and,

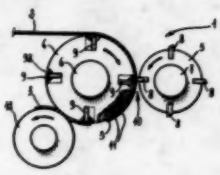
means for repeatedly severing the continuous web along a severance axis extending transversely of the web to separate successive individual articles from the web.

4,943,341

DEVICE WITH CONTRAROTATING KNIVES FOR SEVERING FILTER CIGARETTE UNITING BANDS FROM WEBS IN AUTOMATIC FILTER TIPPING MACHINES

Riccardo Mattei, Bologna, Italy, assignor to G. D. Societa Per Azioni, Bologna, Italy

Filed Jun. 22, 1983, Ser. No. 506,711
Claims priority, application Italy, Jul. 14, 1982, 3482 A/82; Mar. 25, 1983, 3377 A/83
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—517 7 Claims



1. An apparatus for cutting pieces from a web of flexible material which comprises:

a first drum provided with a cylindrical suction surface for drawing material of said web thereagainst but able to slide relative to said material while maintaining said material adherent thereto, said first drum being provided with an array of angularly equispaced knives having edges lying along a cylinder corresponding substantially to said surface of said drum and generally along respective generatrices thereof but with an inclination to a respective generatrix and adapted to lie in a tangent plane whereby one portion of each knife is located lower than another portion of the same knife edge, the one portion and the other portion of each knife edge being radially spaced equidistantly from the axis of said drum by a greater distance than a radial spacing of an intermediate portion of the respective knife edge from said axis;

a second drum juxtaposed with the first drum and provided with an array of knives angularly equispaced on said second drum and projecting outwardly beyond a surface of said second drum, the knives of said second drum lying generally along generatrices thereof with edges passing into said tangent plane, said drums having axes of rotation lying in a common axial plane perpendicular to said tangent plane said knives of said second drum having edges lying along another cylinder, said cylinders being tangent to one another; and

means for rotating said drums in opposite senses and said first drum with a greater peripheral speed than said second drum such that the knives of the two drums meet in a shearing action at said tangent plane to commence cutting said material at one side of said axial plane and continue cutting said material as the meeting knives pass through said axial plane, a cut piece of said material thus formed being retained by suction against the surface of said first drum while said surface slips relative to the remainder of said web, said intermediate portion of the respective knife edge of said first drum coincides with a tangential point of the edges of both arrays of knives in said tangent plane.

4,943,342

COMPONENT FEEDING DEVICE FOR CIRCUIT BOARD MOUNTING APPARATUS

Valia S. Golemon, 1004 State Park Rd., Lockhart, Tex. 78644

Filed Aug. 29, 1988, Ser. No. 237,883
Int. Cl.[5] B32B *31/16*
U.S. Cl. 156—584 8 Claims

4. In a component assemblying apparatus having means for intermittently feeding a component transport tape toward a component pickup station, said tape including a component carrier strip and a component retainer strip removably attached to said carrier strip;

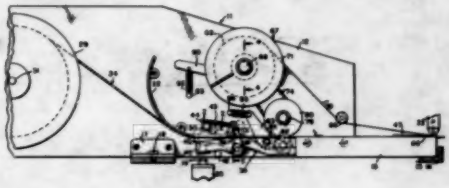
a device for stripping said retainer strip from said carrier strip

comprising

a takeup reel for said retainer strip,

a pulley connected to said reel,

a cog wheel,



mean for rotating said cog wheel,

a cog belt having a driving strand and a driven strand, said belt being loosely wrapped over said pulley and in driving connection with said cog wheel, and

a belt tensioning device for yieldably varying the tension in said driving strand whereby to vary the torque applied to said pulley by said belt in accordance with the drag imposed on said retainer strip upon stripping said retainer strip from said carrier strip.

4,943,343

SELF-ALIGNED GATE PROCESS FOR FABRICATING FIELD EMITTER ARRAYS

Zaher Bardai, 5229 Doris Way, Torrance, Calif. 90505; Randy K. Rolph, 1011 Avenue C, Redondo Beach, Calif. 90277; Arlene E. Lamb, 2010 Curtis Ave., Redondo Beach, Calif. 90278; Robert T. Longo, 734 Callita St., Arcadia, Calif. 91006; Arthur E. Manoly, 26630 Basswood Ave., Rancho Palos Verdes, Calif. 90274, and Ralph Forman, 21516 Hilliard Blvd., Rocky River, Ohio 44116

Filed Aug. 14, 1989, Ser. No. 393,199
Int. Cl.[5] H01L *21/306;* B44C *1/22;* C03C *15/00;* C23F *1/02*
U.S. Cl. 156—643 13 Claims

1. A process for fabricating a field emitter array, said process comprising the steps of;

forming substantially conical field emitter elements on a surface of a substrate;

depositing a layer of oxide over said substrate surface and said field emitter elements;

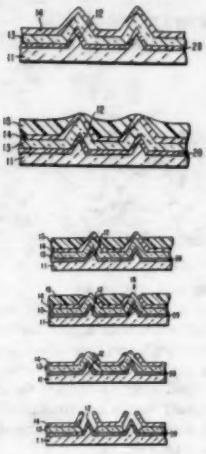
depositing a layer of metal over said layer of oxide to form a gate metal layer;

depositing a layer of photoresist over said gate metal layer;

plasma etching said layer of photoresist in an oxygen atmosphere to cause portions of photoresist above respective field emitter elements to be removed and thereby expose respective portions of said gate metal layer above respective tip regions of said field emitter elements;

etching the exposed portions of said gate metal layer using said layer of photoresist as a mask;

removing said layer of photoresist; and



etching the exposed portions of said layer of oxide to expose said field emitter elements.

4,943,344

ETCHING METHOD

Shinichi Tachi, Sayama; Kazunori Tsujimoto, Higashiyamato; Sadayuki Okudaira, Ome, and Kiichiro Mukai, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 112,144, Oct. 26, 1987, abandoned.

This application Jun. 6, 1989, Ser. No. 362,099

Claims priority, application Japan, Oct. 29, 1986, 61-255648

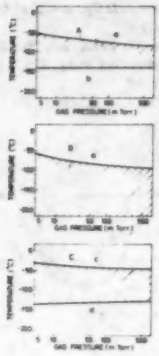
Int. Cl.[5] H01L *21/308*; B44C *1/22*

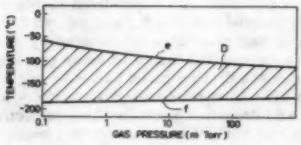
U.S. Cl. 156—643 **7 Claims**

1. An etching method for etching a single crystal silicon substrate, comprising:

providing an organic film as an etching mask on the silicon substrate, having at least one opening which exposes at least one portion of the silicon substrate,

etching at least one exposed portion with a plasma of an etching gas and forming at least one trench on the silicon substrate by continued etching of the at least one exposed portion, wherein the etching gas contains neither carbon nor silicon but is sulphur hexafloride (SF_6), and wherein etching is carried out while the silicon substrate is maintained at a temperature lower than −100° C. so that the reaction probability between the fluorine which is contained in the plasma and the surface atoms of the silicon substrate is less than 1/10 of the reaction probability at 20° C., thereby achieving a high selection ratio of etching





speed of said silicon substrate to etching speed of said organic resist film.

4,943,345

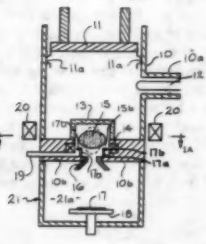
PLASMA REACTOR APPARATUS AND METHOD FOR TREATING A SUBSTRATE

Jes Asmussen, Okemos, and Donnie K. Reinhard, East Lansing, both of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Mar. 23, 1989, Ser. No. 328,017

Int. Cl.[5] B44C *1/22*; B05D *3/02*

U.S. Cl. 156—643 **38 Claims**



12. A method for exposing a substrate to excited species from an electrodeless plasma which comprises:

(a) providing an apparatus for exposing a substrate to excited species produced by a plasma which comprises: reaction chamber means surrounding and providing a confined space around the substrate which is in the reaction cham-

ber means; radiofrequency wave generating means mounted on the reaction chamber means including a metallic coupler means with a hollow cavity or a waveguide for the radiofrequency waves and a tuning means, the coupler means having an opening defining a longitudinal axis directed at the substrate; plasma confining means having a space with a first cross-section between opposed ends in which the plasma is to be generated mounted in the coupler means around the longitudinal axis which is directed at the substrate with an inlet means into the confining means for a gas which is to be converted to a plasma; and aperture means having a second cross-section at one end of the confining means closest to the substrate which is smaller in cross-section than the first cross-section of the confining means and which restricts the flow of the excited species from the plasma into the reaction chamber means and onto the substrate wherein in operation of the apparatus the plasma is created in the space in the confining means and the excited species from the plasma pass through the aperture means into the chamber means and impinge on the substrate;

(b) providing a gaseous material in the confining means from the inlet means so as to form the plasma; and

(c) exposing the substrate to the excited species from the aperture means, wherein a plasma positioning means provided on the apparatus is used to position the plasma in the space in the confining means during operation of the apparatus.

4,943,346

METHOD FOR MANUFACTURING PRINTED CIRCUIT BOARDS

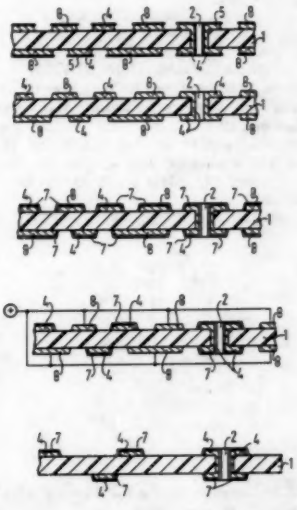
Antoon Mattelin, Oostkamp, Belgium, assignor to Siemens Aktiengesellschaft, Berlin and Munich

Filed Sep. 1, 1989, Ser. No. 401,834

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1988, 3833094

Int. Cl.[5] **B44C** *1/22*; **C23F** *1/02*; **C03C** *15/00, 25/06*

U.S. Cl. 156—651 **17 Claims**



1. A method for manufacturing printed circuit boards, comprising the steps of:

generating a metal layer on an insulating substrate;

applying a first etch resist layer onto said metal layer;

selectively removing said etch resist layer so as to expose a first undesired region of said metal layer;

completely etching said first undesired region away leaving a second undesired region of said metal layer and a desired region of said metal layer;

applying a second etch resist layer onto said second undesired region and said desired region of said metal layer;

selectively removing said second etch resist layer from said second undesired region of said metal layer;

anodically contacting said second undesired region of said metal layer; and

completely electrolytically etching said second undesired region away so as to leave said desired region of said metal layer remaining.

4,943,347

METHOD OF REFINING FIBROUS MATERIAL BY CONTROLLING THE FEED RATE OF MATERIAL OR THE GAP DISTANCE BETWEEN DISCS

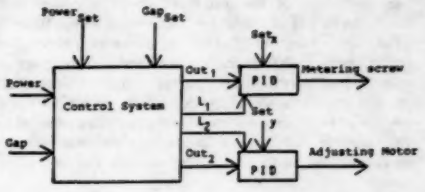
Mats Floden, Box 128, Taby, Sweden (S-18322)

Continuation of Ser. No. 306,231, Feb. 3, 1989, abandoned, which is a continuation of Ser. No. 60,052, Jun. 9, 1987, abandoned. This application Sep. 20, 1989, Ser. No. 410,023

Claims priority, application Sweden, Aug. 20, 1985, 8503882

Int. Cl.[5] **D21D** *5/20*; **D21F** *7/06*

U.S. Cl. 162—61 **9 Claims**



1. A method of refining fibrous material under predetermined operational conditions utilizing relatively rotating refining means which are driven by a driving motor, the material being introduced by a metering means and forced to pass through a gap between discs of the refining means and thereby being exposed to bending forces and axial forces with the flow of material being regulated by a positioning device for regulating the rate of feed of the metering means and a separate positioning device for regulating the gap between the discs of the refining means, comprising the steps of:

(a) monitoring at least two operational variables including the power to the driving motor and the gap distance between the discs of the refining means to determine a measured value for each operational variable;

(b) comparing said measured value of said at least two operational variables with each other and a predetermined set point value for each operational variable which are indicative of the setting for each operational variable when applied to refining conditions to determine if a disturbance exists relative to the predetermined operational conditions;

(c) determining based upon the comparisons which operational variable requires adjustment to eliminate the noted disturbance;

(d) emitting a control signal to independently operate one of said positioning devices so as to adjust either the rate of feed of the metering means or the gap distance between the discs to thereby reduce the disturbance and maintain the refining process within the predetermined conditions.

4,943,349

PROCESS FOR PREPARING A SHEET MATERIAL WITH IMPROVED ON-MACHINE RETENTION

Daniel Gomez, Mimizan, France, assignor to Papeteries de Gascogne, Mimizan, France

Continuation of Ser. No. 594,440, Mar. 30, 1984, abandoned, which is a continuation of Ser. No. 312,946, Oct. 20, 1981, abandoned. This application Feb. 20, 1987, Ser. No. 18,754
Claims priority, application France, Oct. 21, 1980, 80 22501
Int. Cl.[5] D21H *3/02*
U.S. Cl. 162—158 11 Claims

1. A process using paper-making techniques for producing a fibrous sheet comprising fibers, an organic binder, a non-binding mineral filler and a flocculant, designed to improve the retention of the mineral filler in the sheet, sheet formation and the sheet's physical properties, which comprises the following steps in the following order:

dispersing a non-binding mineral filler in an aqueous medium at a concentration from 150 to 600 g/l,

mixing an anionic organic binder selected from the group consisting of native starches, chemically, enzymatically or thermally modified starches, dextrines, cascin, animal glue, vegetable proteins, cellulose esters, alginates carboxylated or uncarboxylated styrene-butadiene latexes, acrylic latexes, styrene acrylics, vinyl acetates, neoprene latexes, acrylonitrile latexes and vinyl chloride latexes with the dispersed filler under agitation, continuously in a mixer in order to obtain an aqueous dispersion of mineral filler particles coated with binder which, after dilution, has a concentration from 50 to 200 g/l before flocculation;

carrying out continuously ionic destabilization of said aqueous dispersion of mineral filler particles coated with binder by means of a cationic flocculant selected from the group consisting of aqueous solutions of polyethylenimine, polyamido-amine, cross-linked polyalkylamine, modified polyacrylamides, polyaluminium chloride and quaternary ammonium compounds in order to obtain improved flocculation control and good uniformity of the floc particle size, which favors formation, appearance, uniformity of surface and dimensional stability of the sheet;

then continuously introducing the mineral filler/organic binder flocs in aqueous suspension into the refined pulp storage vat, conveying the mixture thus prepared to the head box and subsequently subjecting it to the draining, wet pressing and drying usual treatments of the paper manufacturing process for obtaining the fibrous sheet

wherein the amount of binder lies between 1 and 40 parts by weight per 100 parts by weight of fibers and filler.

4,943,350

CHEMICALLY TREATED PAPER PRODUCTS - TOWEL AND TISSUE

Larry Bogart, Penn Valley; James J. Hipkins, Prospect Park, and Nathan A. Edelson, Bala Cynwyd, all of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 82,103, Aug. 6, 1987, abandoned. This application Oct. 21, 1988, Ser. No. 261,941
Int. Cl.[5] D21H *17/10*
U.S. Cl. 162—158 9 Claims

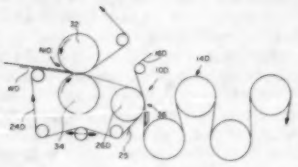
1. A method of simultaneously absorbing water or aqueous body fluids from the human skin while imparting to the skin an emollient effect by wiping the skin with a web of cellulosic fibers treated with an emollient composition consisting essentially of a water-soluble emollient, said emollient comprising a triquaternary phospholipid complex derived from a fatty acid in an amount from 0.1 to 2% by weight of the web.

4,943,351

TRANSFER APPARATUS AND METHOD

Gregory L. Wedel, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed May 23, 1988, Ser. No. 197,537
Int. Cl.[5] D21F *3/04*
U.S. Cl. 162—205 18 Claims



1. A transfer apparatus for transferring a web from a press nip to a dryer section, said apparatus comprising:

a backing roll;

a press member cooperating with said backing roll for defining therebetween the press nip;

a press blanket defining an endless loop, said press blanket extending through the press nip such that the web is disposed between said blanket and said backing roll during passage of the web through the press nip;

a backing drum disposed downstream relative to the press nip and inside said endless loop such that said blanket and the web extend contiguously relative to each other from the press nip to said backing drum;

a dryer felt and said blanket moving around and cooperating with a portion of the circumference of said backing drum such that the web is sandwiched between said blanket and said felt during passage of said blanket, web and felt around said portion of the circumference of said backing drum; and

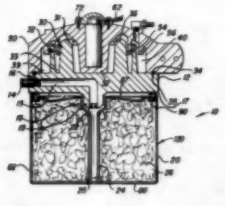
transfer means disposed adjacent to said backing drum for transferring the web without open drawn from said blanket to said felt such that the web follows said felt through the dryer section.

4,943,352

OIL RECLAMATION DEVICE

Byron Lefebvre, Lauderhill, and Jelle P. Schoen, Fort Lauderdale, both of Fla., assignors to Purifiner Manufacturing Company, Rosemont, Ill.

Continuation-in-part of Ser. No. 61,823, Jun. 15, 1987, abandoned. This application Jun. 6, 1988, Ser. No. 202,248
Int. Cl.[5] B01D *27/08, 35/18*
U.S. Cl. 196—46.1 17 Claims



1. A fluid reclamation device for filtering solid and liquid impurities from fluid comprising;

a removable filter assembly comprising a housing including a cylindrical body and a bottom wall secured to said cylindrical body, a fluid distribution tube mounted in said housing, a cover plate member with attachment means and fluid passageway means secured to said cylindrical

body, and cotton fiber filter means contained in said cylindrical body positioned around said fluid distribution tube, said cotton fiber filter means including a plastic fiber containing an oxygen inhibitor, said plastic fiber breaking down at a predetermined temperature to release said oxygen inhibitor;

an evaporator plate mounted to said cover plate member attachment means, with opposing surfaces of said evaporator plate and mounted cover plate member forming an oil receiving chamber;

fluid inlet means including a throughgoing channel formed in the evaporator plate in fluid communication with the fluid distribution tube allowing fluid to be distributed into said filter body;

an evaporator head mounted to the evaporator plate by fastening means forming an evaporation chamber between the evaporator head and the evaporator plate for receiving fluid from the filter body through the fluid passageway means of the cover plate member into the oil receiving chamber and circulating the fluid in the evaporation chamber;

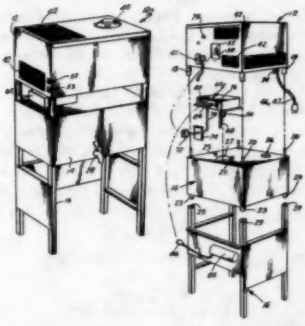
a heater means mounted in said evaporator head having a surface to surface engagement with the evaporator head for heating the fluid circulating in the evaporation chamber causing evaporation of liquid impurities in the fluid, vent means mounted to said evaporator head for discharging the evaporated impurities and a fluid outlet means leading from the evaporation chamber for discharging filtered fluid.

4,943,353

CONTROL FOR MODULAR WATER DISTILLER

David J. Shannon, Lincoln, Nebr., assignor to Pure Water, Inc., Lincoln, Nebr.

Filed Mar. 10, 1988, Ser. No. 166,509
Int. Cl.[5] B01D *3/42*; F16K *21/18*
U.S. Cl. 202—181 12 Claims



1. A water distillation apparatus comprising:

a stand-alone distillation unit adapted to semi-manual operation in which operation of the distillation unit is initiated to produce distilled water in response to the manual addition of raw water thereto and is terminated in response to said raw water being substantially converted to distilled water, said distillation unit having a steam generator including a boiling tank, means for manually adding water to said boiling tank, water level monitoring means for monitoring the level of water in said boiling tank and energizing means responsive to said monitoring means for energizing said steam generator when the level of water in said boiling tank is above a first predetermined level and deenergizing said steam generator when said level is below said first predetermined level, said distillation unit further including condensing means connected with said steam generator for condensing steam produced by said steam generator into distilled water;

a holding tank adapted to receive distilled water from said condensing means; and

an add-on control selectively connectable with said stand-alone distillation unit for converting said stand-alone distillation unit to an automatically controlled distillation apparatus, said add-on control including:

holding tank water level monitoring means for monitoring the level of water in said holding tank;

feedwater valve means configured to be connected to said steam generator and a source of water and operative for admitting feedwater to said steam generator; and

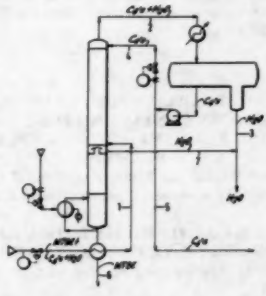
control means responsive to said energizing means and said holding tank water level monitoring means for operating said feedwater valve means only when said level of water in said holding tank is below a second predetermined level and said steam generator is not energized in order to automatically fill the boiling tank when the level of water therein drops below said first predetermined level provided that the level of water in said holding tank is not above said second predetermined level and to disable the distillation unit when the level of water in said holding tank is above said second predetermined level by withholding feedwater from the steam generator when the level in the holding tank is above said second predetermined level.

4,943,354

PROCESS FOR THE CONTINUOUS SEPARATION OF WATER FROM METHYL TERT-BUTYL ETHER MIXTURES

Günther Osterburg, Rheurdt, and Milan Prezelj, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 17,664, Feb. 24, 1987, abandoned. This application Mar. 17, 1989, Ser. No. 326,493
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1986, 3606121
Int. Cl.[5] C07C *41/42*
U.S. Cl. 203—14 1 Claim



1. In a process for the separation of methyl tert-butyl ether from a mixture comprising methyl tert-butyl ether, water and C_4 hydrocarbons by fractional distillation in a distillation column having means for vaporization of liquid at the base of the column and means for condensing vapors passing overhead therefrom and for returning a portion of the resultant condensate to the top of the column as reflux, the improvement which comprises:

(a) introducing a feed mixture comprising C_4 hydrocarbons and methyl tert-butyl ether containing dissolved water into the distillation column at a feed point intermediate the base and top of the column,

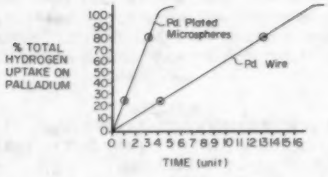
(b) distilling C_4 hydrocarbon overhead with entrained water vapor,
(c) condensing the distillate vapors with the formation of two immiscible liquid phases comprising a first water-rich phase and a C_4-rich phase,
(d) returning a portion of the C_4-rich phase to the top of the column as reflux,
(e) collecting a second water-rich phase and an immiscible methyl tert-butyl ether-rich phase at a point in the column below the feed point and above the base of the column,
(f) withdrawing the second water-rich phase from the distillation column, and
(g) recovering methyl tert-butyl ether substantially freed from dissolved water from the base of the column.

4,943,355

IMPROVED PROCESS FOR PRODUCING UNIFORMLY PLATED MICROSPHERES

James A. Patterson, 2074 20th St., Sarasota, Fla. 34234

Filed May 16, 1989, Ser. No. 353,260
Int. Cl.[5] C25D 7/00; C23C 18/18
U.S. Cl. 204—20 **16 Claims**



1. A process for producing microspheres having uniformly thick metal plating comprising the steps of:
forming cross-linked polymer microspheres;
separating said microspheres into fractions of uniform size using sieves;
further separating each separated fraction into subfractions of uniform size and density using hydraulic separation in a cone;
removing separately from said cone each subfraction; and
plating a selected separated subfraction with metal to a desired thickness.

4,943,356

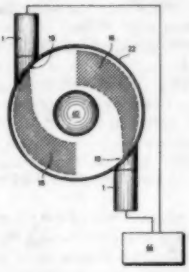
METHOD AND APPARATUS FOR CLEANING SULPHUR AND NITROGEN CONTAINING FLUE GASES BY REACTION UNDER THE ACTION OF ELECTRON BEAMS

Walter Dietrich, Hanau am Main, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau I, Fed. Rep. of Germany

Continuation of Ser. No. 818,777, Jan. 14, 1986, abandoned. This application Jul. 13, 1989, Ser. No. 379,484
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 3501158
Int. Cl.[5] B01J 19/08
U.S. Cl. 204—157.3 **18 Claims**

1. Method for cleaning flue gases containing sulfur and nitrogen, comprising the following steps:
adding a gaseous reagent tot he flue gases to form a mixture,
flowing the mixture at a pressure of between 1 and 5 bar through a reaction chamber having a cylindrical outer wall defining a substantially circular cross-section,
injecting a plurality of electron beams into the reaction chamber from beam sources having respective pressure step stages wherein the electron beams are unimpeded by solid matter, each said beam being injected along a path substantially parallel to a respective tangent to the circular cross-section and closer to said tangent than tot he center of the circular cross-section, each said beam diverging in said reaction chamber to form a profile.

6. Apparatus for cleaning flue gases containing sulfur and nitrogen, comprising
means for adding a reagent to said flue gases to form a mixture,
a reaction chamber of substantially circular cross-section through which said mixture is flowed,



a plurality of electron beam sources arranged about the reaction chamber, each beam source comprising a pressure step stage through which the beam is injected into the reaction chamber unimpeded by solid matter, each said beam source being arranged to inject the respective beam substantially parallel to a respective tangent to the circular cross-section and closer to said tangent than to the center of the circular cross-section.

4,943,357

PHOTODEGRADATION OF METAL CHELATE COMPLEXES

William P. Van Antwerp, Pacific Palisades, Calif.; Mark G. Steinmetz, Shorewood, and Paul R. Goudy, Jr., Bayside, both of Wis., assignors to Photo Redux Corp., Milwaukee, Wis.

Filed Jun. 27, 1988, Ser. No. 211,784
Int. Cl.[5] B01J 19/12
U.S. Cl. 204—157.15 **12 Claims**

1. A method of photodegrading a metallic chelate complex comprising forming an aqueous solution of a metallic chelate and directing ultraviolet light into said solution to photodegrade the metallic chelate and isolate the metallic portion, said ultraviolet light having a wavelength of no greater than about 193 nm.

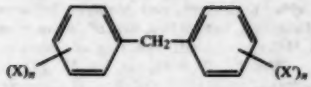
4,943,358

OXIDATION PROCESS

Kenneth M. Dear, Great Sutton, and Philip J. Turner, Widnes, both of England, assignors to Interox Chemicals Limited, London, United Kingdom

Filed Mar. 15, 1989, Ser. No. 323,976
Claims priority, application United Kingdom, Mar. 19, 1988, 8806583
Int. Cl.[5] B01J 19/08
U.S. Cl. 204—157.93 **27 Claims**

1. A process for the oxidation of a diphenyl methane to the corresponding benzophenone in which process a diphenyl methane compound in a reaction medium which includes an organic phase comprising a hydrophobic organic solvent is reacted with bromine whilst irradiating with light of a sufficiently short wavelength to generate bromine radicals from the bromine, wherein
(a) the diphenyl methane compound is selected from compounds having the general formula:



in which each of X and X' represents independently a halogen or sulpho or nitro group or a phenyl group, and n and n' each is an integer from 0 to 3,

(b) the reaction medium comprises an aqueous phase in addition to the organic phase, said aqueous phase containing HBr and H_2O_2 at concentrations sufficient to react to generate bromine in solution in said aqueous phase,

(c) the amount of HBr present is greater than equimolar to the said diphenyl methane compound, and

(d) the total amount of hydrogen peroxide reacted in the reaction medium is at least approximately 1.5 moles per mole of the said diphenyl methane compound.

4,943,359

PROCESS FOR APPLYING AN AQUEOUS, HEAT-CURABLE COATING TO CANS

Hans-Peter Patzschke; Albrecht Lüttenberg, both of Wuppertal; Hans-Jürgen Schlinsog, Wülfrath, and Wolfgang Bogdan, Wuppertal, all of Fed. Rep. of Germany, assignors to Herberts Gesellschaft mit beschränkter Haftung, Wuppertal, Fed. Rep. of Germany

Continuation of Ser. No. 5,689, Jan. 21, 1987, abandoned. This application Apr. 6, 1988, Ser. No. 180,595

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1986, 36015601

Int. Cl.[5] C08L *63/00*; C09D *5/44*

U.S. Cl. 204—181.6 **8 Claims**

1. A method for coating a beverage or food can with an anticorrosive protective layer, comprising applying to a surface of said can an aqueous, heat-curable coating mixture of 40–85 weight percent based on resin solids of a component A, and 0–25 weight percent based on resin solids of a component B, and 5–40 weight percent based on resin solids of a component C as crosslinking agent, together with up to 20 weight percent based on the total weight of the coating mixture of an organic solvent, with or without conventional lacquer additives, pigments, and/or fillers, wherein the said ingredients:

Component A is a mixture of (i) 40–90 weight percent based on the mixture of a fatty acid-free, acidic epoxide resin phosphate ester having an acid number of 10 to 150, prepared by reaction between (a) an acid and (b) an epoxide group-containing polyglycidyl ether and/or a polyglycidyl (meth)acrylate resin, having more than 1.3 epoxide groups per molecule, and having an epoxide equivalent weight of 180 to 5,000, and (ii) 10–60 weight percent based on the mixture of a phenol-modified, carbonyl group-containing, oil-free polyester having an acid number of 15 to 175 and an OH-number of 15 to 175 and prepared by reaction of (a) a polyester polyol or a hydroxyl group-containing precondensate of a polyester polyol, with a hydroxyl group-containing phenol ether, or (b) an oil-free polyester with a mononuclear or a polynuclear phenol and with aldehyde, or (c) a resol from a mono- and/or a polynuclear phenol with a carboxyl group-containing polyester;

component B is an epoxide graft copolymer having an acid number of 30 to 200 which is the reaction product of (i) a fatty acid-free polyglycidyl ether having more than 1.3 epoxide groups per molecule and an epoxide equivalent weight of 1,000 to 5,000, with (ii) an α,β-unsaturated monocarboxylic acid; and

component C is a fully etherified amine-formaldehyde condensation resin and/or a fully etherified phenol-formaldehyde condensation resin having, on the average, at least 2 reactive sites per molecule; and

curing the applied layer.

5. The method of claim 1, wherein said cans are coated by anodic electrode position.

4,943,360

PROCESS FOR RECOVERING NITRIC ACID AND HYDROFLUORIC ACID FROM WASTE PICKLE LIQUORS

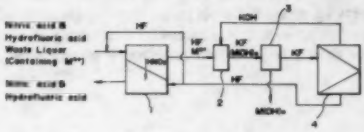
Masanori Sugisawa; Takashi Sasaki, and Yoshihito Nishimoto, all of Hyogo, Japan, assignors to Shinko Pantec Company, Limited, Kobe, Japan

Filed Oct. 27, 1988, Ser. No. 263,353

Claims priority, application Japan, Nov. 18, 1987, 62-290875

Int. Cl.[5] C25D *13/00*

U.S. Cl. 204—182.3 **4 Claims**



1. A method for regenerating a waste liquor containing nitric acid and hydrofluoric acid to recover highly pure nitric and hydrofluoric acids therefrom which comprises:

adding hydrofluoric acid, or an acid mixture of nitric and hydrofluoric acids having a major content of the hydrofluoric acid, to a nitric acid and hydrofluoric acid waste liquor;

subjecting the resulting mixture to removal of the acids by dialysis with an ion-exchange electrodialyzer for acid recovery to recover the dialyzed acids; in such an amount that the solution obtained after the acid removal has a molar ratio of fluorine ions and nitrate ions of at least 1 or greater;

neutralizing the solution, from which the acids have been removed, with an alkali;

separating the resultant precipitate from the neutralized acid-removed solution;

subjecting the separated solution to an ion-exchange membrane electrodialyzer using a combination of a bipolar membrane, an anion-exchange membrane and a cation-exchange membrane for separation into the acids and the alkali; and

recovering the separated acids and alkali.

4,943,361

PLASMA TREATING METHOD AND APPARATUS THEREFOR

Yutaka Kakehi, Hikari; Yutaka Omoto, Kudamatsu, and Takeshi Harada, Chiyoda, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 3,026, Jan. 13, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 289,512

Claims priority, application Japan, Jan. 17, 1986, 61-6439; Sep. 5, 1986, 61-207881

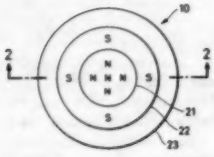
Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—192.32 **16 Claims**

1. A plasma treating method comprising a step of supplying a treating gas into a treating chamber and evacuating to a predetermined pressure, the treating chamber including parallel plate electrodes comprised of an anode and a cathode opposed to each other; a step of applying an electric power to the cathode as one of the parallel plate electrodes to thereby generate an electric field between said parallel plate electrodes; a step of generating a magnetic field by providing magnetic field generating means including a first magnetic pole which has substantially a shape of a disc, and a second magnetic pole which has a ring shape, which has a plurality opposite to that of said first magnetic pole and which surrounds an outer cir-

cumference of said first magnetic pole, in proximity thereto, the first and second magnetic poles including N-poles and S-poles facing the cathode with the anode between the N-poles and S-poles and the cathode, the N-poles and S-poles being in proximity to each other such that the lengths of lines of magnetic force extending at right angles to the electric field, in proximity to the cathode, are relatively short as compared to that of lines of magnetic force extending substantially parallel to the electric field, so as to restrict cycloidal motion of electrons, and to cause mainly a cyclotronic motion of electrons toward said anode side to occur; and a step of treating a specimen arranged at said cathode by using plasma generated by the cyclotronic motion of electrons.

6. A plasma treating apparatus comprising a treating chamber, the treating chamber including parallel plate electrodes comprised of an anode and a cathode opposed to each other; a gas supplying means for supplying a treating gas into the treating chamber; an evacuating means for evacuating said treating chamber to a predetermined pressure; a power supply connected to said cathode, so as to generate an electric field between the anode and cathode; and a magnetic field generating means for generating a magnetic field starting from a surface of said anode toward said cathode and returning to said anode, wherein the magnetic field generating means includes a first magnetic pole which has substantially a shape of a disc, and a second magnetic pole, which has a ring shape, which has a polarity opposite to that of said first magnetic pole and which surrounds an outer circumference of said first magnetic pole, in proximity thereto, the magnetic field generating means including N-poles and S-poles facing the cathode with the anode between the N-poles and S-poles and the cathode, the N-poles and S-poles being arranged in proximity to each other such that lines of magnetic force extending at right angles to the electric field, in proximity to the cathode, are relatively short as compared to that of lines of magnetic force extending substantially parallel to the electric field, so as to restrict cycloidal motion of electrons and to cause mainly a cyclotronic motion of electrons toward said anode side to occur.



4,943,362

SPUTTERING TARGET FOR PRODUCING OPTICALLY TRANSPARENT LAYERS AND METHOD OF MANUFACTURING THESE TARGETS

Guenther Schlamp, Steinbach; Klaus P. Gall; Adolf Langer, both of Rodenbach, and Georg Ptaschek, Rosbach, all of Fed. Rep. of Germany, assignors to Demetron Gesellschaft Fuer Elektronik-Werkstoffe m.b.H., Hanau, Fed. Rep. of Germany

Filed May 19, 1988, Ser. No. 195,845

Claims priority, application Fed. Rep. of Germany, May 20, 1987, 3716852

Int. Cl.[5] C23C *14/34*; C03C *17/09*

U.S. Cl. 204—298.13 **12 Claims**

1. A sputter target for producing optically transparent surface layers which reflect heat, in combination with a layer of silver on a transparent substrate, said target consisting essentially of bismuth with 0.2 to 10% by weight manganese, characterized in that the manganese is present in the form of the intermetallic compound BiMn in even, finely dispersed particles distributed within a matrix of metallic bismuth particles.

4,943,363

CATHODE SPUTTERING SYSTEM

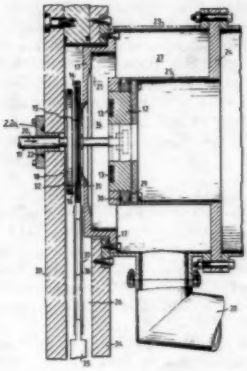
Jaroslav Zejda, Rodenbach, and Manfred Schuhmacher, Alzenau-Michelbach, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 10, 1989, Ser. No. 377,132

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1989, 3912295

Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—298.15 **18 Claims**



1. A cathode sputtering system for coating substrates in a vacuum chamber, comprising:

a rotating substrate carrier positioned within the chamber, the substrate carrier including at least one conveyor spoon that extends radially from a central axis of the chamber, the conveyor spoon including a substrate receptacle member positioned at a radial end of the spoon, the substrate receptacle member being axially movable along the axis of rotation;

a sputtering cathode station operatively attached to and in communication with the chamber;

a loading station operatively attached to and in communication with the chamber; and

an unloading station operatively attached to and in communication with the chamber.

4,943,364

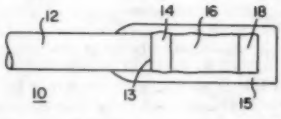
FIBER OPTIC CO_2 SENSOR

Mark Koch, Mt. Prospect, and Richard C. Murray, Jr., Palatine, both of Ill., assignors to Spectramed, Inc., Oxnard, Calif.

Continuation-in-part of Ser. No. 747,488, Jun. 21, 1985, abandoned. This application Jun. 23, 1986, Ser. No. 877,572

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—415 **9 Claims**



1. A fiber-optic probe for measuring the partial pressure of carbon dioxide in a medium, comprising:

a gas-permeable membrane;

a hydrolyzed hydrogel including a dye/bicarbonate/gel acrylic or ethylene oxide polymer within the gas/permeable membrane, the hydrogel having been prepared from a chemically and optically unstable dye/gel acrylic or eth-

ylene oxide polymer which, prior to treatment, contains weakly bonded dye molecules and exhibits a substantial drift in measured pH with time accompanied by an increase in protonation constant, by a treatment comprising (1) contacting the unstable polymer with a dilute aqueous base solution for a period of time sufficient to remove weakly bonded dye molecules from the polymer (2) washing the base-treated polymer with water to remove substantially all the base, (3) contacting the washed polymer with a solvent having a high affinity for water to remove water from the polymer and give a polymer characterized by chemical and optical stability with respect to dye loss with time and a consistently repeatable protonation constant, and (4) conditioning the stable polymer by contacting it with a bicarbonate solution;

means for providing light to the hydrolyzed hydrogel, and means for transmitting absorbable light from the hydrolyzed hydrogel.

4,943,365

METHOD FOR THE PRODUCTION OF MODIFIED PITCHES AND THE FURTHER APPLICATION

Winfried Boenigk, Olfen; Maximilian Zander, Castrop-Rauxel, and Jürgen Stadelhofer, Bad Soden, all of Fed. Rep. of Germany, assignors to Rütgerswerke AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 9, 1987, Ser. No. 23,646

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608130

Int. Cl.[5] G10C *1/20*

U.S. Cl. 208—44 **16 Claims**

1. A method for alkylation of pitches comprising

mixing 100 weight parts of a hydrocarbon pitch with from about 5 to 50 weight parts of a reactive alkyl compound having from 1 to 4 carbon atoms, where at least one hydrogen atom of the alkyl is substituted by an aromatic substituent and where the alkyl groups is selected from a member of the group consisting of alkyl groups having a multiple bond between two carbon atoms, alkyl groups having a substituent for hydrogen of the alkyl which substituent is selected from a member of the group consisting of hydroxy, expoxy, thiol, and mixtures thereof, and mixtures thereof to provide an active section to the alkyl for facilitating alkylation;

alkylating the hydrocarbon pitch with the reactive alkyl compound in a liquid phase at a pressure of less than about 1000 bar and at a temperature of from about 100 to 400 degrees centigrade.

4,943,366

PRODUCTION OF HIGH OCTANE GASOLINE

Ronald H. Fischer, Cherry Hill; Rene B. LaPierre, Medford; Peter J. Owens, Mantua, and Philip Varghese, Voorhees, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 940,382, Dec. 10, 1986, Pat. No. 4,738,766, which is a continuation-in-part of Ser. No. 825,294, Feb. 3, 1986, Pat. No. 4,676,887, which is a continuation-in-part of Ser. No. 740,677, Jun. 3, 1985, abandoned. This application Apr. 6, 1988, Ser. No. 178,157

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.[5] C10G *47/18, 47/20, 69/04, 69/10*

U.S. Cl. 208—68 **21 Claims**

1. A process for producing a high octane gasoline, which comprises hydrocracking a highly aromatic, substantially dealkylated hydrocarbon feed having an initial boiling point of at least 300° F. and an end point of not more than 650° F., an aromatic content of at least 50 weight percent, an API gravity of not more than 25 and a hydrogen content not more than 12.5 weight percent at a hydrogen partial pressure of not more than 1000 psig and a conversion of greater than 50% and not more than 85% to gasoline boiling range products having an octane rating of at least 87 (RON+0), said hydrocracking taking place in the presence of a catalyst comprising a large pore size crystalline silicate zeolite and a matrix comprising silica.

4,943,367

PROCESS FOR THE PRODUCTION OF HIGH PURITY COKE FROM COAL

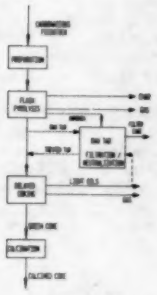
John C. Nixon; John A. Eady, and Christopher G. Goodes, all of Victoria, Australia, assignors to Comalco Aluminum Limited; Alcoa of Australia Limited, both of Melbourne and Alcan Australia Limited, Sydney, all of, Australia

Continuation of Ser. No. 173,047, Mar. 28, 1988, abandoned, which is a continuation of Ser. No. 906,519, Sep. 12, 1986, abandoned. This application Jun. 21, 1989, Ser. No. 370,166

Claims priority, application Australia, Sep. 12, 1985, PH2396

Int. Cl.[5] C10G *9/14*

U.S. Cl. 208—131 **4 Claims**



1. Process for the production of high purity coke from black coal, which comprises the following steps:

(a) beneficiating the coal to an ash content not exceeding 20%;

(b) air drying the product of step (a) to less than 10% moisture;

(c) crushing the product of step (b) to a particle size less than 0.18 mm;

(d) subjecting the product of step (c) to a flash pyrolysis in a fluidized bed reactor in which it is rapidly heated in an inert atmosphere to a temperature in the range 400° to 800° C. at atmospheric or near atmospheric pressure, whereby it decomposes into tar vapor, char and gas components;

(e) rapidly quenching the product of step (d) to condense liquid tar, filtering the liquid tar to remove char therefrom, and neutralizing acidic components of the said liquid tar;

(f) subjecting the liquid tar product of step (e) to delayed coking to produce coke and coker oils;

(g) dividing the coker oils from step (f) into light oils boiling below 300° C. and heavy oils boiling above 300° C., and recycling heavy oils to step (f); and

(h) calcining coke from step (f) to produce a high purity coke of volatile content less than 0.5%.

4,943,368

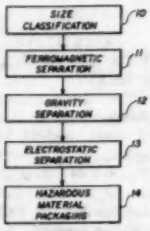
NONMETALLIC ABRASIVE BLASTING MATERIAL RECOVERY PROCESS INCLUDING AN ELECTROSTATIC SEPARATION STEP

Stanley R. Gilbert, Coraopolis, and Thomas E. Weyand, Beaver, both of Pa., assignors to Pittsburgh Mineral & Environmental Technology, Inc., Monaca, Pa.

Continuation-in-part of Ser. No. 271,608, Nov. 15, 1988, abandoned. This application Feb. 27, 1989, Ser. No. 316,085

Int. Cl.[5] B07B *13/00*; B24C *9/00*

U.S. Cl. 209—2 **7 Claims**



1. A dry abrasive blasting residue separation process wherein a nonmetallic abrasive blasting material is separated from the blasting residue comprising:

(a) a size classification step to eliminate large objects form the abrasive blasting residue and to concentrate the residue for further processing;

(b) a ferromagnetic separation step to remove ferrous objects from the blasting residue which would interfere with further processing of it;

(c) a gravity separation step to reclaim large particles of the nonmetallic abrasive blasting material from the blasting residue and to concentrate the fine blasting residue containing fine particles of the nonmetallic abrasive blasting material and nonconducting paint particles; and

(d) an electrostatic separation step to reclaim the fine particles of the nonmetallic abrasive blasting material and separate it from the fine nonconducting paint particles.

4,943,369

METHOD AND APPARATUS FOR COMBINING A PLURALITY OF SERIALLY SUPPLIED SHEETS

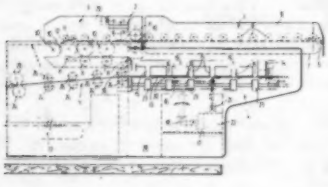
Jacobus F. Gombault, Drachten, Netherlands, assignor to HADWE B. V., Drachten, Netherlands

Filed Mar. 11, 1987, Ser. No. 24,566

Claims priority, application Netherlands, Mar. 11, 1986, 8600631

Int. Cl.[5] B07C *5/34*; G06K *9/00*

U.S. Cl. 209—583 **14 Claims**



1. A method of combining a plurality of serially supplied sheets into a set according to data carried by said sheets and read by a reader, and discharging the set to a further handling station, which comprises reading the data on a first sheet of the set, subsequently deflecting and displacing the remaining part of the sheet, out of its plane of transport into a new plane of transport, arresting said first sheet in a flat condition, reading the data from each subsequent sheet and similarly deflecting and displacing each subsequent sheet of a set into a position overlying the preceding sheet, and discharging the set in a predetermined direction depending upon the data read from the sheets after thus completing the set.

4,943,370

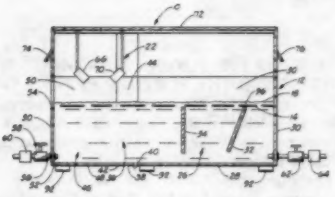
METHOD AND APPARATUS FOR MONITORING MATERIAL IN A LIQUID

Edmund P. Gortowski, Louth, England, assignor to Conoco Inc., Ponca City, Okla.

Filed May 16, 1988, Ser. No. 194,595

Int. Cl.[5] C02F *1/40*

U.S. Cl. 210—85 **7 Claims**



1. An apparatus for monitoring the presence in a liquid of a material which is at least partially immiscible in the liquid, comprising:

a slick inducing means for inducing the material to form a slick on the surface of the material which comprises:

a container for receiving the liquid which comprises:

a settling portion for reducing the turbulence of the liquid to be received;

a concentrating portion for concentrating said slick downstream of said settling portion; and

an intermediate constricting portion for gradually constricting said surface of the liquid;

overflow outlet means for allowing a surface layer of said liquid including said surface to flow out of said container;

means for detecting the presence of said slick on said surface of the liquid; wherein said settling portion comprises:

a settling base portion;

a wall extending upwardly from said settling base portion;

an adjustably angled baffle disposed in said settling portion; and

a second, fixed baffle disposed in said settling portion downstream of said adjustably angled baffle.

4,943,371

APPARATUS FOR REDUCING PITTING IN COPPER WATER PIPES

Ganev Tsviatko, Torbjrönsgatan 34, S-753 35 Uppsala, and Fallman Göran, Timmermansgatan 34, S-753 33 Uppsala, both of Sweden

PCT No. PCT/SE86/00145, § 371 Date Nov. 24, 1986, § 102(e) Date Nov. 24, 1986, PCT Pub. No. WO86/05772, PCT Pub. Date Oct. 9, 1986

PCT Filed Mar. 27, 1986, Ser. No. 942,415

Claims priority, application Sweden, Mar. 27, 1985, 8501525

Int. Cl.[5] C02F *5/00*

U.S. Cl. 210—101 **6 Claims**

1. An apparatus for reducing pitting in copper water pipes, comprising:

a regenerable softening filter, comprising a first inlet connection for accepting unsoftened water and a first outlet connection for discharging softened water;

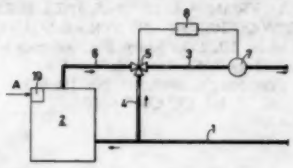
a means for mixing softened and unsoftened water, located downstream from said first outlet connection, comprising

a second and third inlet connection and a second outlet connection;

a first pipe means connected to said first inlet connection for introducing unsoftened water to said regenerable softening filter;

a second pipe means connected to said first outlet connection for conducting softened water from said regenerable softening filter to said second inlet connection of said means for mixing;

a third pipe means connected to said third inlet connection



of said means for mixing, for conducting unsoftened water from said first pipe means, to be blended with softened water from said second pipe means;

a fourth pipe means connected to said second outlet connection of said means for mixing, for conducting a mixed flow of softened and unsoftened water for final use; and

a regulating system, located downstream from said means for mixing in said fourth pipe means, for controlling the mixing of said softened and unsoftened water by a hardness degree in said means for mixing, and for controlling the regeneration of said regenerable softening filter.

4,943,372

METHOD AND APPARATUS OF DISCHARGING A DISC FILTER

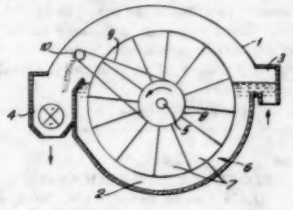
Raimo Kohonen, Savonlinna, Finland, assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Nov. 1, 1988, Ser. No. 265,691

Claims priority, application Finland, Nov. 2, 1987, 874800

Int. Cl.[5] B01D *33/23, 33/46*

U.S. Cl. 210—324 **4 Claims**



1. A discharge means for a disc filter used for treatment for fiber suspensions in the pulp industry, said disc filter comprising a plurality of disc elements (6) disposed adjacently on a common shaft (5), said disc elements comprising a plurality of sectors and filter surfaces arranged on top of said sectors, the discharge means comprising movable conveying means disposed between the disc elements (6) for transferring filter cakes detached from the filter surface to a discharge member (4) disposed outside the circumference of the filter disc elements, said conveying means including a belt conveyor (9), one sheave (8) disposed on the common shaft (5), and another sheave (10) arranged above the discharge member (4), the belt conveyor (9) being arranged so as to encompass both the one sheave and the another sheave.

4,943,373

HYDROPHILIC POROUS MEMBRANE OF POLYVINYLIDENE FLUORIDE AND METHOD FOR PRODUCTION THEREOF

Makoto Onishi; Yukio Seita, and Noriyuki Koyama, all of Fuji, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

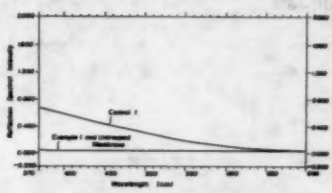
PCT No. PCT/JP88/00019, § 371 Date Jul. 12, 1989, § 102(e) Date Jul. 12, 1989, PCT Pub. No. WO88/05062, PCT Pub. Date Jul. 14, 1988

PCT Filed Jan. 11, 1988, Ser. No. 391,516

Claims priority, application Japan, Jan. 12, 1987, 62-4638

Int. Cl.[5] B01D *31/00*; C08J *9/26*

U.S. Cl. 210—500.42 **3 Claims**



1. A hydrophilic porous membrane of polyvinylidene fluoride having uniform hydrophilicity imparted to the surface of pores therein, which porous membrane is characterized by the fact that the reflection spectrum thereof in the visible zone is substantially unchanged from that which existed before the treatment for impartation of said hydrophilicity.

4,943,374

USE OF A MICROPOROUS MEMBRANE CONSTRUCTED OF POLYETHER SULFON AND HYDROPHILIZATION AGENT FOR THE FILTRATION OF BEER

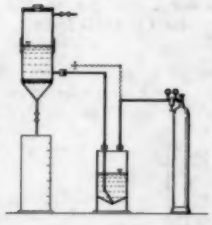
Hans-Ulrich Heininger, Aschau; Wilhelm Munninger, Rohrdorf-Thansau, and Ernst Pawlowsky, Bad Aibling, all of Fed. Rep. of Germany, assignors to Gessner & Co., GmbH, Fed. Rep. of Germany

Filed Apr. 25, 1988, Ser. No. 185,516

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1988, 3813488

Int. Cl.[5] B01D *13/00*

U.S. Cl. 210—651 **43 Claims**



1. A process for the separation of harmful germs, turbid substances and yeast from beer comprising filtering beer containing germs, turbid substances and/or yeast with a microporous membrane, constructed of polyether sulfone and a hydrophilization agent, having a pore size in the range of between 0.1 and 1.2 microns.

4,943,375

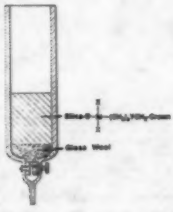
THE PROCESS OF SEPARATING A SELECTED ION FROM A PLURALITY OF OTHER IONS IN A MULTIPLE ION SOLUTION BY CONTACTING THE SOLUTION WITH A MACROCYCLIC LIGAND BONDED TO SILICA WHICH SELECTIVELY COMPLEXES WITH THE DESIRED ION

Jerald S. Bradshaw; Reed M. Izatt; Ronald L. Bruening, all of Provo, and James J. Christensen, deceased, late of Provo, all of Utah (by Virginia Christensen, successor in title), assignors to Brigham Young University, Provo, Utah

Continuation-in-part of Ser. No. 93,544, Sep. 4, 1987, abandoned. This application Sep. 6, 1988, Ser. No. 240,689

Int. Cl.[5] B01D *15/00*

U.S. Cl. 210—674 **14 Claims**



1. The process of separating a selected ion from a plurality of other ions in a multiple ion solution comprising by flowing the multiple ion solution through a column packed with a composition of matter comprising silica covalently bonded to a hydrocarbon chain covalently bonded to a macrocyclic compound having at least four A-C-C groups in which A is selected from O, O - CH_2, S, S - CH_2, N - R and N - (R) - CH_2 in which R is selected from H, methyl. alkyl and benzyl, and the hydrocarbon chain has an end group

which is covalently bonded to the silica and in which X is selected from lower alkyl, benzyl, phenyl, halogen, - O - CH_3, - O - C_2H_5 and - O - Silica.

4,943,376

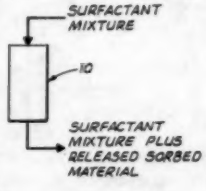
SURFACTANT ENHANCED REGENERATION OF HYDROPHOBIC MATERIALS

John F. Scamehorn, 701 Grill Ave., and Jeffrey H. Harwell, 331 Skyline, both of Norman, Okla. 73071

Filed Apr. 1, 1988, Ser. No. 176,616

Int. Cl.[5] B01D *15/06*

U.S. Cl. 210—674 **21 Claims**



1. A method for treating hydrophobic material having sorbed material sorbed thereon to remove sorbed material therefrom, comprising the step of:

contacting the hydrophobic material having sorbed material thereon with a surfactant solution consisting essentially of a surfactant and water with a surfactant concentration of at least a critical micelle concentration so at least a portion of the sorbed material is solubilized and thereby released from the hydrophobic material, thereby leaving the hydrophobic material containing less sorbed material and a mixture comprising the surfactant and a released sorbed material.

4,943,377

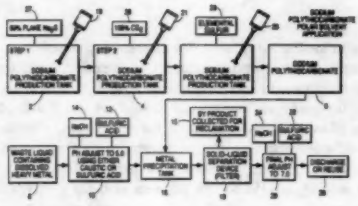
METHOD FOR REMOVING DISSOLVED HEAVY METALS FROM WASTE OILS, INDUSTRIAL WASTEWATERS, OR ANY POLAR SOLVENT

Thomas G. Legare, III, Lake Mary, Fla., assignor to Environmental Technology (U.S.), Inc., Sanford, Fla.

Filed May 6, 1988, Ser. No. 190,875

Int. Cl.[5] C02F *1/52*

U.S. Cl. 210—709 **3 Claims**



1. The method of treating liquids containing dissolved heavy metals comprising the steps of:

forming a solution of sodium polythiocarbonate by mixing sodium sulfide with water to completely dissolve said sodium sulfide;

mixing said dissolved sodium sulfide with carbon disulfide to form a solution of sodium trithiocarbonate;

adding sulfur to said solution and mixing at 50°–160° F. until completely reacted into a solution of sodium polythiocarbonate;

adjusting the pH of said liquid to 5.0±0.5;

precipitating said dissolved heavy metals from said liquid by intermixing the sodium polythiocarbonate with said liquid until a one to two milligram per liter excess of sodium polythiocarbonate occurs to produce a liquid containing precipitated metallic solids including said heavy metals;

maintaining said excess of sodium polythiocarbonate for 10–20 minutes; and

separating said precipitated metallic solids from said liquid.

4,943,378

FLOCCULATION PROCESSES

Peter Flesher; David Farrar, and John R. Field, all of West Yorkshire, England, assignors to Allied Colloids Ltd., United Kingdom

Continuation of Ser. No. 145,622, Jan. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 855,509, Aug. 23, 1986, Pat. No. 4,720,346. This application Mar. 15, 1989, Ser. No. 325,093

Claims priority, application United Kingdom, Aug. 25, 1986, 8510496; Oct. 29, 1986, 8526624

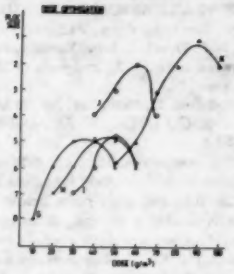
The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.

Int. Cl.[5] C02F *1/56*

U.S. Cl. 210—734 **22 Claims**

1. A process for dewatering an aqueous suspension of suspended solids comprising adding to the suspension a flocculating amount of a synthetic polymeric flocculant material to form thereby an aqueous medium containing flocculated solids

and dewatering the aqueous medium and in which the said polymeric material has a specific viscosity (measured by a capillary viscometer at 34° C. on 0.5% solution deionised water) above 10 and comprises, cross linked water insoluble



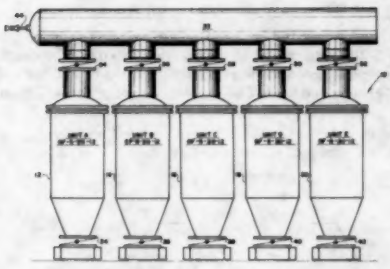
water swellable polymeric particles that have a dry size of below 10 μm, the polymeric material is added in a floc stabilising amount, and the dewatering is effected under shear by a process selected from centrifugation, belt pressing and piston pressing.

4,943,379

APPARATUS AND PROCESS FOR FILTERING FLUIDS

Ronald A. Boze, 19 Wisteria La., Covington, La. 70433, and Theodore A. Warning, 11227 Rippling Meadow, Houston, Tex. 77064

Continuation of Ser. No. 96,634, Sep. 14, 1987, Pat. No. 4,874,533. This application Jun. 5, 1989, Ser. No. 361,242
The portion of the term of this patent subsequent to Oct. 17, 2006, has been disclaimed.
Int. Cl.[5] B01D *37/02*
U.S. Cl. 210—778 **14 Claims**



1. A process of filtering a fluid having suspended contaminants, comprising the steps of:

providing a filtration vessel having at least one filter element mounted therein, the filter element having an interior and an exterior;

providing means for delivering the fluid to be filtered into the filtration vessel;

introducing a flow of the contaminated fluid into the filtration vessel;

forming a layer of filter media on the exterior side of the filter element;

removing filtrate from the interior of the filter element and delivering it outside of the filtration vessel;

detecting a pressure differential of a predetermined value across the filter element;

interrupting a flow of contaminated fluid into the filtration vessel and a flow of filtrate out of the vessel;

providing a backflushing reservoir containing a pressurized backflushing fluid;

providing a normally closed valve means preventing fluid communication between the filtration vessel and the backflushing reservoir during filtration process;

opening the valve means and allowing the pressurized backflushing fluid to enter the interior of the filter element;

backflushing the filter element by a fluid pressurized to a level at least slightly above a level of pressure differential across the filter element at a velocity sufficient to create a backflushing shock capable a dislodging the contaminants which formed a layer on the exterior of the filter element; and

removing the dislodged contaminants from the filtration vessel.

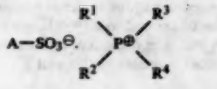
4,943,380

ANTISTATIC RESIN COMPOSITION WITH TRANSPARENCY CONTAINING PHOSPHONIUM SULPHONATE

Masato Sugiura; Hideo Shimizu; Shigeru Imamura, and Fumitoshi Sugiura, all of Aichi, Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 98,534, Sep. 18, 1987, abandoned. This application Feb. 27, 1989, Ser. No. 316,603
Int. Cl.[5] C08K *5/50*; C09K *3/16*; B05D *7/02*; B32B *27/18*
U.S. Cl. 252—8.7 **1 Claim**

1. An antistatic resin composition with transparency characteristics comprising 90–99.9 wt % of a synthetic resin selected from polycarbonate or polymethyl methacrylate and 0.1–10 wt % of a heat-resistant antistat comprising phosphonium sulfonate shown by the general formula (I) below:



(I)

wherein A is alkyl group with 1–36 carbon atoms, alkenyl group with 4–24 carbon atoms, phenyl group, phenyl group substituted by alkyl group with 1–18 carbon atoms, naphthyl group or naphthyl group substituted by alkyl group with 1–18 carbon atoms, R^1, R^2 and R^3 are identical, each being an aliphatic hydrocarbon group with 1–8 carbon atoms or aromatic hydrocarbon group, and R^4 is a hydrocarbon group with 1–18 carbon atoms.

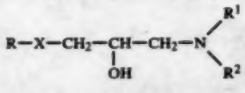
4,943,381

NITROGEN-CONTAINING ADDITIVES FOR NON-AQUEOUS FUNCTIONAL FLUIDS

Emyr Phillips, Sale; Robert M. Neil, Boothstown, both of England, and Hermann O. Wirth, Bensheim, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 195,553, May 18, 1988, Pat. No. 4,859,354, which is a division of Ser. No. 838,986, Mar. 12, 1986, Pat. No. 4,762,628. This application Jun. 14, 1989, Ser. No. 366,118
Int. Cl.[5] C10M *129/04*
U.S. Cl. 252—51.5 R **8 Claims**

1. A composition having corrosion inhibiting properties which comprises a non-aqueous functional liquid and an effective corrosion-inhibiting amount of at least one compound of formula I



(I)

wherein X is —O— R^1 is unsubstituted C_1–C_4alkyl or C_2–C_5alkyl substituted by one to three hydroxyl groups, R^2 is hydro-

gen, unsubstituted $C_1$14 C_4alkyl or C_3–C_8alkyl substituted by one to three hydroxyl groups, with the proviso that at least one of the residues R^1 or R^2 is hydroxy-substituted, and R is branched C_4–C_{20}alkyl, C_2–C_{18}alkenyl, C_2–C_3alkynyl or C_5–C_{12}cycloalkyl.

4,943,382
LACTONE MODIFIED DISPERSANT ADDITIVES USEFUL IN OLEAGINOUS COMPOSITIONS

Antonio Gutierrez, Mercerville, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Apr. 6, 1988, Ser. No. 178,100
Int. Cl.[5] C10M *149/12*
U.S. Cl. 252—51.5 A **74 Claims**

1. A lactone modified adduct of an aminated, hyrdocarbyl substituted C_4–C_{10} dicarboxylic acid producing material useful as an oil additive and formed by first reacting a non-polymerizable lactone selected from the group consisting of lactones and thiolactones having up to four carbon atoms in the lactone ring with an aminated, hyrdocarbyl substituted C_4–C_{10} dicarboxylic acid producing material to form an intermediate adduct, and then, in a separate step, reacting said intermediate adduct with a C_3–C_9 polymerizable lactone at a temperature of from about 30° C. for a period sufficient to effect ring opening polymerization of said C_3–C_9 lactone to form the lactone modified adduct acid producing material being formed by reacting an olefin polymer of a C_2–C_{10} monoolefin having a number average molecular weight of about 700 to about 5,000 and a C_4–C_{10} monounsaturated dicarboxylic acid material, wherein there is an average of 0.7 to about 2.0 sicarboxylic producing moieties per molecule of said olefin polymer used in the reaction, said aminated hydrocarbyl substituted C_4–C_{10} dicarboxylic acid producing material having been aminated with a non-heterocyclic amine selected from the group consisting of polyamines of about 2 to 60 total carbon atoms and about 2 to 12 nitrogen atoms in the molecule, and said lactone modified adduct product containing the unit

$$-\left[\overset{O}{\overset{\|}{C}}(CH_2)_qO\right]_m-$$

wherein m represents the average degree of polymerization and has a average value of from 0.2 to about 100 and q is 4 to 8.

24. An oleaginous composition comprising an oleaginous lubricating oil and a poly lactone modified adduct material prepared by first reacting a non-heterocyclic polyamine with a hydrocarbyl substituted C_4–C_{10} dicarboxylic acid producing material to form a neutralized reaction product having at least one reactive amino group, then reacting said neutralized reaction product with a non-polymerizable lactone selected from the group consisting of lactones and thiolactones having up to four carbon atoms in the lactone ring to form an intermediate adduct, and then, in a separate step, reacting said intermediate adduct with a C_3–C_9 polymerizable lactone at a temperature of from about 30° to about 200° C. for a period sufficient to effect ring opening polymerization of said C_3–C_9 lactone, said hydrocarbyl substituted C_4–C_{10} dicarboxylic acid producing material being formed by reacting an olefin polymer of a C_2–C_{10} monolefin of 700 to about 5,000 M_n with a C_4–C_{10} monounsaturated dicarboxylic acid material, wherein there is an average of from about 0.7 to about 2.0 dicarboxylic acid producing moieties per molecule of said olefin polymer used in the reaction, and wherein said lactone modified adduct material contains the unit

$$-\left[\overset{O}{\overset{\|}{C}}(CH_2)_qO\right]_m-$$

where m represents the average degree of polymerization and is a number having an average value of from 0.2 to about 100 and q is 4 to 8, said lactone modified adduct material being useful as an oil additive.

4,943,383
NOVEL LUBRICANT EPOXIDES

Noyes L. Avery, Gwynedd Valey, Pa.; Andrew G. Horodysky, Cherry Hill, N.J.; Derek A. Law, Yardley, Pa., and Leslie R. Rudnick, Lawrenceville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 23, 1988, Ser. No. 210,453
Int. Cl.[5] C01M *107/22, 145/00*
U.S. Cl. 252—52 A **29 Claims**

1. A product of reaction made by epoxidizing C_{30}+ polyalpha-olefin oligomeric hydrocarbon lubricant having a branch ratio of less than 0.19 and pour point below −15° C. in the presence of an epoxidizing amount of an epoxidizing agent wherein the product has a weight average molecular weight between 300 and 150,000 number average molecular weight between 300 and 30,000 and molecular weight distribution between 1 and 5.

4,943,384
CYCLOHEXANE DERIVATIVES

Wolfgang Sucrow, Paderborn; Herbert Wolter, Paderborn-Barkhausen, and Rudolf Eidenschink, Munster, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Nov. 21, 1986, Ser. No. 2,596
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510434; PCT Int'l Appl., Mar. 18, 1986, PCT/EP86/00156
Int. Cl.[5] G02F *1/13*; C09K *19/34, 19/30, 19/06*
U.S. Cl. 252—299.61 **16 Claims**

1. A liquid-crystal phase having at least two liquid crystal components, and comprising at least one transversely polarized 1,4-cyclohexylene compound of the formula I

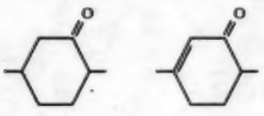
$$R^1—A^1—Z^1—A^2—R^2 \qquad I$$

wherein

R^1 and R^2 are independently H or an alkyl group which has 1–10 C atoms and in which one or two non-adjacent CH_2 groups can also be replaced by 0 atoms and/or —CO— groups and/or —CO—O— groups and/or —CH=CH— groups, or F, Cl, Br, CN or R^3—A^3—Z^2—,

A^1 is —A—, A^4—Z^0—A— or —A—Z^0—A^4—,

A is a group of formula (A) or (J):



(A) (J)

or the mirror image thereof,

A^2, A^3 and A^4 are each 1,4-phenylene which is unsubstituted or substituted by one or two F and/or Cl atoms and/or CH_3 groups and/or CN groups and in which one or two CH groups can also be replaced by M atoms and/or NO, or are 1,4-cyclohexylene wherein one or two non-adjacent CH_2 groups can also be replaced by 0 atoms, or are 1,3-dithiane-2,5-diyl, piperidine-1,4-diyl, 1,4-bicyclo-[2,2,2] octylene, decahydronaphthalene-2,6-diyl or 1,2,3,4-tetrahydronaphthalene-2,6-diyl groups or are —A—,

Z^0, Z^1 and Z^2 are each —CO—O—, —O—CO—, —CH_2C-H_2—, —OCH_2—, —CH_2O—, —CH_2CO—, —$COCH_2$—, —CH_2CHCN—, —$CHCNCH_2$— or a single bond, and

R^3 is H or an alkyl group which has 1–10 C atoms and in

which one or two non-adjacent CH_2 groups can also be replaced by 0 atoms and/or —CO— groups and/or —CO—O— groups and/or —CH=CH— groups, or is F, Cl, Br or CN.

4,943,385

THIOETHER COMPOUND AND LIQUID CRYSTAL COMPOSITION

Hiromichi Inoue; Takashi Inukai; Shinichi Saito; Kazutoshi Miyazawa, and Kouji Ohno, all of Yokohamashi, Japan, assignors to Chisso Corporation, Osaka, Japan

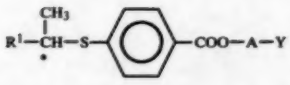
Filed Jun. 14, 1988, Ser. No. 206,372

Claims priority, application Japan, Jun. 15, 1987, 62-148427

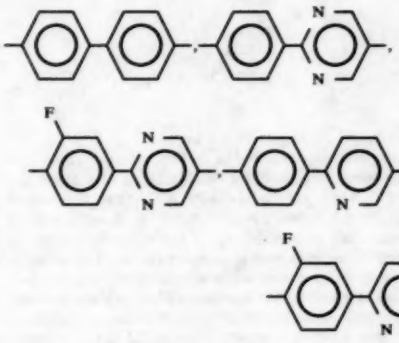
Int. Cl.[5] C09K *19/34, 19/12*

U.S. Cl. 252—299.61 **6 Claims**

1. A thioether compound expressed by the formula



wherein R^1 represents an alkyl group of 2 to 10 carbon atoms; A represents a member selected from the group consisting of



Y represents an alkyl or alkoxy group each of 6 to 12 carbon atoms; and * indicates that the carbon atom having this symbol is optically active.

4,943,386

LIQUID CRYSTALLINE COMPOUNDS HAVING SUBSTITUENTS

Sadao Takehara, Yono; Toru Fujisawa, Kawaguchi; Yoshi Arai, Hasuda, and Jitsuo Kurokawa, Ohmiya, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo and Kawamura Institute of Chemical Research, Saitama, both of, Japan

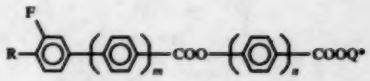
Division of Ser. No. 161,421, Feb. 23, 1988, Pat. No. 4,828,754, which is a continuation of Ser. No. 815,935, Jan. 3, 1986, abandoned. This application Oct. 4, 1988, Ser. No. 252,926

Claims priority, application Japan, Jan. 9, 1985, 60-1791; Apr. 4, 1985, 60-71628; Apr. 4, 1985, 60-71629; Apr. 17, 1985, 60-81688; Apr. 26, 1985, 60-90676

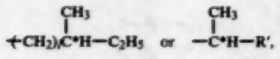
Int. Cl.[5] C09K *19/12*

U.S. Cl. 252—299.65 **19 Claims**

1. A liquid crystalline compound of the formula



wherein R denotes an alkyl or alkoxy group having 6 to 18 carbon atoms; m is 0 or 1; n is 2 when m is 0, or n is 1 when m is 1; and Q* denotes an optically active alkyl group having an asymmetric carbon atom selected from the group consisting of



in which l is an integer of 1-3, R' denotes an alkyl group having 2 to 8 carbon atoms, and C* denotes an assymetrical carbon atom.

4,943,387

CHIRAL SMECTIC LIQUID CRYSTAL COMPOSITION

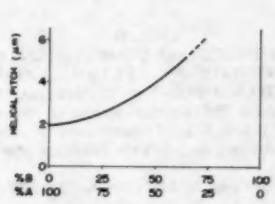
Kenji Furukawa, Yokosukashi, and Kanetsugu Terashima, Yokohamashi, both of Japan, assignors to Chisso Corporation, Osaka and Hitachi, Ltd., Tokyo, both of, Japan

Filed Sep. 28, 1984, Ser. No. 655,624

Claims priority, application Japan, Oct. 5, 1983, 58-186312

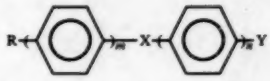
Int. Cl.[5] C09K *19/20, 19/52, 19/12;* **G02F** *1/13*

U.S. Cl. 252—299.67 **6 Claims**

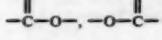


1. A ferroelectric chiral smectic liquid crystal composition comprising at least one first chiral smectic C liquid crystal compound having a twist sense of helix left handed and at least one second chiral smectic C liquid crystal compound having a twist sense of helix right-handed; said first compound being expressed by the general formula

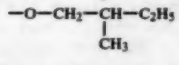
(I)



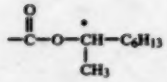
wherein R represents an alkyl or alkyloxy group of 4 to 14 carbon atoms; m and n each represent independently an integer of 1 or 2; X represents



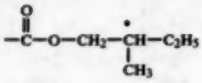
or a single bond; and Y represents



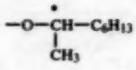
derived from (S)-2-methylbutanol or



derived from (S)-1-methylheptanol, and second compound being expressed by the above-described formula (I) wherein R, m, n and X each represent independently the same as described above; but Y represents



derived from (S)-2-methylbutanol or



derived from (S)-1-methylheptanol.

4,943,388

AZEOTROPE-LIKE COMPOSITIONS OF PENTAFLUOROETHANE; 1,1,1-TRIFLUOROETHANE; AND CHLORODIFLUOROMETHANE

Ian R. Shankland, Williamsville; Robert G. Richard, Cheektowaga, and Earl A. E. Lund, West Seneca, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jun. 28, 1989, Ser. No. 372,576
Int. Cl.[5] C11D *7/30, 7/50*
U.S. Cl. 252—69 **9 Claims**

1. Azeotrope-like compositions consisting essentially of from about 13 to about 86 weight percent pentafluoroethane; from about 7 to about 57 weight percent 1,1,1-trifluoroethane; and from about 7 to about 80 weight percent chlorodifluoromethane which have a vapor pressure of about 167 psia ± about 10 psia at 70° F.

4,943,389

EMULSIFIER FOR WATER-IN-OIL EMULSIONS

John D. Weete, Opelika, Ala., and George L. Griffith, Bethlehem, Pa., assignors to Emulsion Technology, Inc., Parrish, Ala.

Filed Apr. 4, 1988, Ser. No. 177,956
Int. Cl.[5] B01F *17/14*
U.S. Cl. 252—308 **25 Claims**

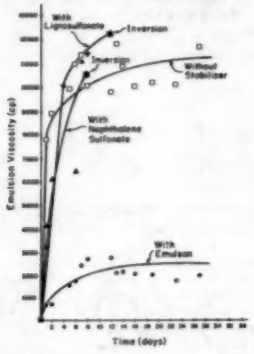
1. A water-in-oil emulsion comprised of
(i) a continuous oil phase,
(ii) a discontinuous aqueous phase, and
(iii) an emulsion stabilizing amount of a thermally altered lecithin composition which has been prepare by heating lecithin at a temperature in the range of from about 100° C. to about 250° C. for a period of time ranging from about 15 to about 480 minutes.

4,943,390

BIOEMULSIFIER-STABILIZED HYDROCARBOSOLS

Michael E. Hayes, Fernandina Beach; Kevin R. Hrebenar, Jacksonville; Patricia L. Murphy, Amelia Island; Laurence E. Futch, Jr., Fernandina Beach; James F. Deal, III, Amelia Island, and Paul L. Bolden, Jr., Fernandina Beach, all of Fla., assignors to Petroleum Fermentations N.V., Curacao, Netherlands Antilles

Continuation of Ser. No. 780,774, Sep. 27, 1985, abandoned, which is a division of Ser. No. 653,808, Sep. 24, 1984, Pat. No. 4,684,372, which is a continuation-in-part of Ser. No. 547,892, Nov. 2, 1983, Pat. No. 4,618,348. This application Sep. 28, 1988, Ser. No. 251,071
Int. Cl.[5] B01F *17/16;* B01J *13/00*
U.S. Cl. 252—355 **51 Claims**



1. A surfactant package which comprises:
(a) at least one water-soluble surfactant, effective amount of which surfactant promotes emulsification of a hydrocarbon with API gravity of about 20° API or less, viscosity of about 100 centipoise or greater at 150 ° F., paraffin content of about 50% by weight or less and aromatic content of about 15% by weight or greater into an aqueous phase to form a hydrocarbon-in-water emulsion wherein the proportion of hydrocarbon to aqueous phase is about 90:10 by volume or less, the viscosity of which emulsion is reduced by at least a factor of about 10 compared to the viscosity of the hydrocarbon; and
(b) at least one water-soluble bioemulsifier produced by a bacterium of the genus Acinetobacter, an effective amount of which bioemulsifier stabilizes a hydrocarbon-in-water emulsion formed with a hydrocarbon as in (a) by maintaining viscosity reduced by at least a factor of about 10 for a period of at least about a day under static conditions.

4,943,391

BICYCLO(3.3.1)NONANE DERIVATIVES AND USE IN STABILIZING ORGANIC MATERIALS

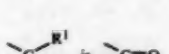
Alexander Aumueller, Deidesheim; Peter Neumann, Mannheim, and Hubert Trauth, Dudenhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 10, 1988, Ser. No. 286,295
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1987, 3743279
Int. Cl.[5] C07D *471/08;* C09K *15/18*
U.S. Cl. 252—401 **13 Claims**

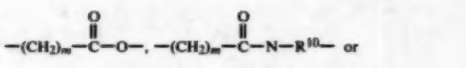
1. A heterocyclic bicyclo[3.3.1]nonane derivative of the formula (I)

(I)

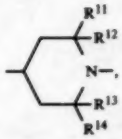
where
n is 1,
R^1 is hydrogen,
R^2 is hydrogen or hydroxyl, or the radical



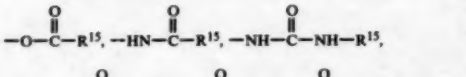
R^3 and R^4 are each independently of the other phenyl or 1- or 2-naphthyl, which phenyl or naphthyl may each be substituted by 1, 2 or 3 C_1–C_{12}-alkyls, C_1–C_{12}-alkoxys, chlorines, bromines, fluorines, trifluoromethyls or cyanos, in the case of 2 or 3 substituents these substituents being identical or different,
A and B are each independently of the other a chemical bond, C_1–C_{22}-alkylene, cycloalkylene



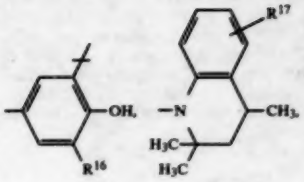
where
m and o are each from 1 to 20 and
R^{10} is hydrogen, C_1–C_{22}-alkyl, C_5–C_{12}-cycloalkyl, C_7–C_{18}-phenylalkyl, phenyl or C_2–C_{22}-cyanoalkyl,
M is a radical of the formula

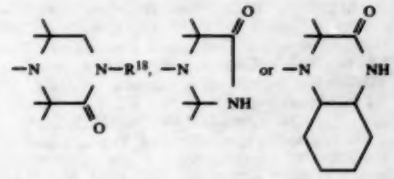


which may be bonded to A not only via the nitrogen atom: but also via the carbon atom, and
R^{11}, R^{12}, R^{13} and R^{14} are each independently of the others C_1–C_4-alkyl, or
R^{11} and R^{12}, R^{13} and R^{14} or R^{11} and R^{12} as well as R^{13} and R^{14} are each together tetramethylene or pentamethylene,
R^5 is hydrogen, cyano, hydroxyl,



R^{15} is hydrogen, C_1–C_{22}-alkyl, C_5–C_{12}-cycloalkyl, C_5–C_{16}-phenylalkyl or a 5- or 6-membered heterocycle, or —M—B—R^5 is a radical of the formula





where
R^{16} is C_1–C_4-alkyl,
R^{17} is hydrogen, C_1–C_4-alkyl or C_1–C_4-alkoxy and
R^{18} is hydrogen or C_1–C_{12}-alkyl.

4,943,392

CONTAINING BUTOXY-PROPANOL WITH LOW SECONDARY ISOMER CONTENT

Charlene M. Hastedt, Fairfield; Ralph F. Medcalf, Jr., West Chester, and Geneva G. Otten, Loveland, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 202,732, Jun. 3, 1988, abandoned. This application May 5, 1989, Ser. No. 346,964

Int. Cl.[5] C11D *3/065, 3/44*

U.S. Cl. 252—539 **6 Claims**

1. An aqueous liquid detergent composition comprising:
(a) from about 0.1% to about 40% of detergent surfactant;
(b) from about 0.5% to about 25% of butoxy-propanol containing less than about 20% of secondary isomer;
(c) from 0% to about 30% of detergency builder; and
(d) at least about 50% water, said composition being packaged in a container that is not adapted to create a spray.

4,943,393

PROCESS FOR THE MANUFACTURE OF ESTER SULFONATE PASTES OF LOW VISCOSITY

Bernd Fabry, Korschenbroich, and Robert Piorr, Ratingen-Hoesel, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

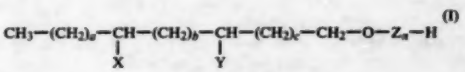
Filed Feb. 13, 1989, Ser. No. 310,274

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1988, 3804609

Int. Cl.[5] C11D *1/28*

U.S. Cl. 252—554 **11 Claims**

1. A process for the preparation of an aqueous concentrate of an α-sulfonated fatty acid alkyl ester comprising the steps of: (a) sulfonating an alkyl fatty acid ester with a sulfonating agent to produce an α-sulfonated fatty acid alkyl ester; (b) adding to said α-sulfonated fatty acid alkyl ester from about 1 to about 10 mole percent of the total moles of said α-sulfonated fatty acid alkyl ester of at least one compound of the formula



(I)

wherein in the compound of formula I X and Y are different and are OH or SO_3M wherein M is selected from the group

consisting of hydrogen, an alkali metal ion, an alkaline earth metal ion, or NR_4 wherein R is hydrogen, an alkyl or hydroxy alkaly radical having from 1 to 4 carbon atoms; a and c are integers having a value of from 0 to 18; b is an integer having a value of from 0 to 2 such that the sum of a+b+c is from 12 to 18; Z is an oxyethylene, oxypropylene, or oxybutylene group; n is an integer having a value of from 0 to 30; and (c) neutralizing said α-sulfonated fatty acid alkyl ester with an aqueous alkaline solution.

4,943,394

METHOD OF STORING RADIOACTIVE WASTE WITHOUT RISK OF HYDROGEN ESCAPE

Herbert Lammertz, Jülich, and Kornelius Kroth, Linnich, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Jan. 25, 1989, Ser. No. 301,435

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802755; European Pat. Off., Nov. 23, 1988, 88119450.0

Int. Cl.[5] G21F *9/16, 9/02*; C01B *1/26, 6/04*

U.S. Cl. 252—628 **11 Claims**

1. Method of storing radioactive waste material in which waste material is solidified or pressed and then sealed in a container, comprising the steps of:

introducing a content of potassium permanganate into a nonreducing packing and enveloping material for said waste material, said packing and enveloping material being composed of at least one material which is a member of the group consisting of cement and other concrete-forming materials and granular and pulverized aluminum oxide, grog, fire-clay and other ceramics, and thereby producing a permanganate-containing packing and enveloping material in which potassium permanganate is dispersed for eliminating hydrogen generated by said waste material during storage, and

enveloping said radioactive waste material in a mass of said permanganate-containing packing and enveloping material within a common long-term storage container.

4,943,395

PROCESS OF VITRIFYING RADIOACTIVE LIQUID WASTE WITH SUPPRESSED FORMATION OF GASEOUS RUTHENIUM

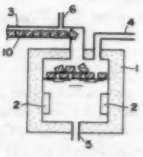
Noriaki Sasaki, Katsuta, and Kazuhisa Matsunaka, Naka, both of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Mar. 23, 1989, Ser. No. 327,773

Claims priority, application Japan, Mar. 28, 1988, 63-73710

Int. Cl.[5] G21F *9/16, 9/08*

U.S. Cl. 252—629 **11 Claims**



8. A process of vitrifying a radioactive liquid waste by absorbing a radioactive liquid waste into a glass frit cartridge made of molded glass fibers and heat-melting said cartridge to vitrify said liquid waste, characterized in that a reducing agent in solid form is previously incorporated in said glass frit cartridge made of molded glass fibers, and a radioactive liquid waste containing ruthenium is then absorbed in to said glass frit cartridge containing said reducing agent, thereby suppressing the formation of gaseous ruthenium during the heat-melting.

4,943,396

PROCESS FOR PREPARING LINEAR ALPHA, OMEGA DIFUNCTIONAL MOLECULES

Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 22, 1988, Ser. No. 247,476

Int. Cl.[5] C09F *5/00, 5/08*

U.S. Cl. 260—405.5 **5 Claims**

1. A process for preparing a mixture of difunctional molecules which process comprises:

(a) contacting an olefin having at least one terminal functional group wherein said terminal functional group is selected from groups having the formulas

and O- wherein Z is selected from a hydrocarbyl group having from 1 to about 20 carbon atoms, a hydrocarbyl oxy group having from 1 to about 20 carbon atoms and hydrogen, at isomerization conditions with an isomerization catalyst selected from the group consisting of alumina supported palladium, silica supported palladium, tantalum halide/oxide-metal oxide and niobium halide/oxide-metal oxide,

(b) contacting the product of a) at metathesis conditions with a metathesis catalyst selected from the group consisting of WCl_6/Me_4Sn and Re_2O_7/Al_2O_3- R_4Sn wherein R is an alkyl group, and

(c) recovering the product of step(b), and

(d) separating difunctional molecules from the product of step c).

4,943,397

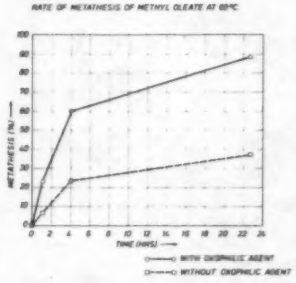
METATHESIS OF FUNCTIONAL OLEFINS

Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

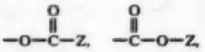
Filed Sep. 22, 1988, Ser. No. 247,478

Int. Cl.[5] C09F *5/00, 7/08*

U.S. Cl. 260—405.5 **10 Claims**



1. A process for metathesizing an olefin having at least one terminal functional group wherein said terminal functional group is selected from groups having the formulas



and O—Z wherein Z is selected from a hydrocarbyl group having from 1 to about 20 carbon atoms, a hydrocarbyloxy group having from 1 to about 20 carbon atoms and hydrogen, which comprises contacting said olefin at metathesis conditions with a catalyst comprising: (a) an oxide, chloride or

bromide of a transition metal selected from tungsten, molybdenum and rhenium, (b) an organometallic compound based on an element selected from aluminum, tin, lead, magnesium and titanium, in combination with an alkyl group, and (c) an oxophilic agent having a metal-oxygen bond strength greater than the metal-oxygen bond strength of said transition metal and wherein said oxophilic agent is selected from compounds having a formula M—X wherein M is selected from zirconium, samarium, lanthanum and mixtures thereof, and X comprises one or more organic or inorganic species which in combination neutralize M.

4,943,398

METHOD FOR MANUFACTURING A FUSED CAST REFRACTORY

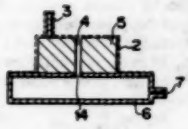
Shigeo Endo; Haruo Kawashima, both of Narita; Kimio Hirata, Katori; Yasuo Saito, Narita; Takao Uchiya, Sawara, and Hideo Yanagi, Kashiwa, all of Japan, assignors to Toshiba Monofrax Co., Ltd., Chiba, Japan

Continuation of Ser. No. 839,280, Mar. 13, 1986, abandoned. This application Nov. 12, 1987, Ser. No. 120,174

Claims priority, application Japan, Mar. 15, 1985, 60-50366; Apr. 8, 1985, 60-72569

Int. Cl.[5] B29C *33/38, 39/02*

U.S. Cl. 264—82 **13 Claims**



1. A method for manufacturing an electrofused cast refractory article, comprising the steps of:

in an oxidizing atmosphere, forming a casting mold having a mold cavity by outlining said cavity with a thermoplastic film and maintaining a casting sand surrounding said cavity by applying a negative pressure through said sand against said film, wherein said sand consists essentially of a silica sand or a Bayer-processed alumina, and wherein each individual sand particle is an aggregate of a large number of fine particles;

pouring molten refractory material into said mold cavity to produce a cast refractory article;

maintaining said negative pressure for a period of time following said pouring step while drawing an oxidizing atmosphere into the mold to keep said refractory material at a sufficiently oxidized state; and

cooling the cast refractory article by burying it in sand corresponding to said casting sand.

4,943,399

CONTINUOUS PREPARATION OF MOLDING MATERIALS BASED ON POLYPHENYLENE ETHERS AND NYLONS

Christof Taubitz, Wachenheim; Hermann Gausepohl, Mutterstadt; Erhard Seiler, Ludwigshafen; Klaus Boehlke, Hessheim, and Lothar Schlemmer, Maxdorf, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 146,182, Jan. 20, 1988, abandoned. This application May 8, 1989, Ser. No. 349,968

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1987, 3702582

Int. Cl.[5] B29B *7/84;* **C08L** *71/12, 77/00*

U.S. Cl. 264—101 **4 Claims**

1. A continuous process for the preparation of a thermoplastic molding material based on polyphenylene ethers (PPE) and nylons in an extruder, wherein

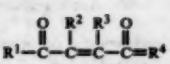
(I) in a first zone at from 240° to 350° C.,

(a_1) from 50 to 99.95% by weight of a polyphenylene ether,

(a_2) from 0 to 45% by weight of a vinylaromatic polymer,

(a_3) from 0.05 to 10% by weight of one or more monomers selected from the group consisting of

(a_{31}) α,β-unsaturated carboxylic acids or their derivatives of the general formula I



(I)

wherein R_1 and R_4 are each hydroxyl, aryloxy, alkoxy, artalkoxy, cycloalkoxy, each of not more than 12 carbon atoms, together form —O— or —NR_5—; R_2 and R_3 are each hydrogen, alkylo, cycloalkyl, each of not more than 12 carbon atoms, aryl, chlorine, or together form alkylene of 4 to 12 carbon atoms; the R^5 is hydrogen, the moiety of alkyl, cycloalkyl, aralkyl, aryl, each moiety being not more than 12 carbon atoms, or the moiety is substituted by C_1–C_4-alkyl or -alkoxy,

(a_{32}) monomers containing amide groups and a polymerizable double bond and

(a_{33}) monomers containing lactam groups and a polymerizable double bond,

(a_4) from 0 to 80% by weight of further graft monomers and

(a_5) from 0 to 20% by weight of a free radical initiator, the percentages in each case being based on the total weight of components a_1 to a_5, are reacted for from 0.1 to 15 minutes, and a modified polyphenylene ether A is prepared, and

(II) then, without cooling the modified polyphenylene ether, in one or more further zones of the extruder at from 250° to 350° C.,

(B) from 5 to 95% by weight of a nylon,

(C) from 0 to 90% by weight of a nonmodified polyphenylene ether,

(D) from 0 to 45% by weight of a vinylaromatic polymer,

(E) from 0 to 40% by weight of a rubber impact modifier and

(F) from 0 to 60% by weight of additives and processing assistants, the percentages being based on the total weight of components A-F, are added, and the resulting mixture is extruded.

4,943,400

METHOD OF MANUFACTURING PRINTING AND EMBOSSING TYPE ELEMENTS

Tadashi Hirano, Tokyo, Japan, assignor to Data Card Japan Ltd., Tokyo, Japan

Continuation of Ser. No. 97,218, Sep. 15, 1987, abandoned, which is a division of Ser. No. 894,565, Aug. 8, 1986, Pat. No. 4,781,479. This application Feb. 2, 1989, Ser. No. 306,236

Int. Cl.[5] B32B *31/20*

U.S. Cl. 264—113 **10 Claims**

1. A method of manufacturing type comprising the steps of: supplying a portion which will serve as a typeface with a prescribed amount of a granular heat-curable resin consisting of particles of a first size having a hardness capable

of withstanding pressure applied at printing and a particle size affording smoothness after molding;

supplying a portion which will serve as an impact face with a prescribed-curable resin brought into adhering contact with the granular heat-curable resin of the first size and consisting of particles of a second size larger than the first size and having a hardness capable of withstanding pressure applied at printing and an elasticity capable of withstanding and of absorbing impact sustained at printing after molding;

heating the granular heat-curable resins in superimposed form; and

applying predetermined amount of pressure at predetermined number of times on the granular heat-curable resins in superimposed form during said heating so that an intermediate joint layer made from a mixture of the granular heat-curable resins of the first and second size is created in enough thickness at a continuously and gradually changing mixing ratio, between the portion which will serve as a typeface and the portion which will serve as an impact face

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4,943,401

PROCESS FOR MAKING SILICON NITRIDE ARTICLES

James P. Edler, and Bohdan Lisowsky, both of Troy, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 21, 1987, Ser. No. 135,864

Int. Cl.[5] C04B *35/58*

U.S. Cl. 264—63 **9 Claims**

1. A process for making a silicon nitride article, said process including the steps of:

(a) providing a homogeneous slurry comprising a mixture of about 40–60 parts by weight silicon powder, about 60–40 parts by weight water, and from about 0.5 to about 3 parts by weight of at least one nitriding agent;

(b) comminuting the slurry of step (a) in a comminutation device to activate the silicon powder and enhance a chemical reaction between the silicon powder and the water;

(c) aging the activated silicon slurry of step (b) for a period of time effective to enable the chemical reaction between the silicon powder and the water to occur;

(d) processing the aged silicon slurry of step (c) to reduce the water content sufficiently to form the article;

(e) forming the processed slurry of step (d) into the article;

(f) heating the article of step (e) from ambient temperature to a temperature of about1000° C. in a hydrogen atmosphere at a rate non-damaging to the article whilst removing volatiles therefrom;

exposing the article of step (f) to gas;

(g) heating the article of step (f) from the temperature of step (f) to a temperature from about 1400° C. to about 1450° C. at a rate of from about 15° C. to about 25 ° C. per hour in said gas mixture of from about 40 parts to about 60 parts helium and from about 1 part to about 4 parts hydrogen and the balance nitrogen, whilst replenishing consumed nitrogen with fresh nitrogen so as to maintain a substantially constant nitriding gas composition while converting the silicon powder therein to silicon nitride; and

(h) cooling the article of step (g) to ambient temperature.

4,943,402

PROCESS FOR REMOVING CHLOROPRENE DIMERS FROM POLYCHLOROPRENE

Fred Y. Kafka, Louisville, Ky.; Archie R. Bice, Landenberg, Pa., and Donald K. Burchett, Louisville, Ky., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 31, 1989, Ser. No. 429,577

Int. Cl.[5] B29C *47/60, 47/76, 71/02*

U.S. Cl. 264—141 **6 Claims**

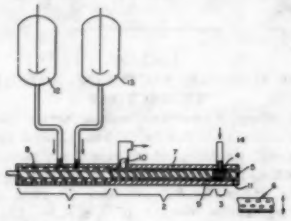
1. A process for removing chloroprene dimers from polychloroprene which comprises:

(a) feeding to a screw extruder a polychloroprene latex,

(b) coagulating the polychloroprene latex in the screw extruder,

(c) feeding the coagulated polychloroprene in the extruder into a dewatering zone,

(d) discharging the coagulated polychloroprene through a flow restriction which heats and pressurizes the polychloroprene to an area of reduced pressure thereby forming a porous polychloroprene crumb while, at the same time, said flow restriction applies back pressure sufficient that



water present in the coagulated polychloroprene is separated therefrom and forced out of a vent provided in the extruder upstream from the flow restriction,

(e) heating the porous polychloroprene crumb discharged from the extruder by passing a stream of gas substantially inert to the polychloroprene through the polychloroprene crumb at a temperature of at least about 100° C. for a time sufficient to strip from the polychloroprene by diffusion at least about 50% by weight chloroprene dimers.

4,943,403

METHOD FOR MOLDING A PULVERULENT MATERIAL

Tsuneo Miyashita; Hiroaki Nishio, and Michitaka Sato, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1986, Ser. No. 872,398

Claims priority, application Japan, Jun. 17, 1985, 60-129960

Int. Cl.[5] B22F *1/00*; B28B *11/22*

U.S. Cl. 264—233 **1 Claim**

1. A process for molding a pulverulent material characterized in that, from a molded product obtained by plasticizing-molding or casting-molding of metallic or ceramic powders, an organic dispersion medium used for molding selected from the group consisting of acetone, methyl alcohol, ethyl alcohol, n-propyl alcohol, i-propyl alcohol, n-butyl alcohol, i-butyl alcohol, sec-butyl alcohol and t-butyl alcohol is removed by extraction with liquid carbon dioxide at a temperature of lower than 31.1° C. and not lower than −30° C. and at a pressure now lower than 75.2 kg/cm^2 absolute.

4,943,404

PROCESS FOR PRODUCING A FIBER REINFORCED THERMOPLASTIC ARTICLE

Joe R. Waldrop, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 120,293, Nov. 13, 1987, abandoned. This application Aug. 30, 1988, Ser. No. 238,328

Int. Cl.[5] B29C *43/18, 43/20*

U.S. Cl. 264—257 **12 Claims**

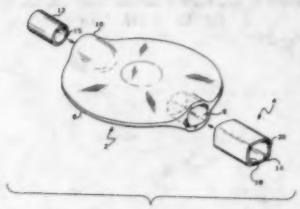
1. A process comprising

(a) positioning a first thermoplastic tubular member reinforced with oriented filaments on a first mandrel and also a second thermoplastic tubular member reinforced with oriented filaments on a second mandrel by closely receiving an end portion of each mandrel in a borehole of its corresponding tubular member;

(b) positioning the first and second mandrels having the

respective first and second tubular members thereon in a portion of a mold cavity so that the first tubular member is spaced from the second tubular member;

(c) filling the remainder of the mold cavity with fiber reinforced thermoplastic matrix;



(d) molding an article in the shape of the mold cavity having the first and second tubular members encapsulated therein;

(e) removing the article from the mold cavity;

(f) removing the first and second mandrels from the respective boreholes of the first and second tubular members in the article.

4,943,405

METHOD AND APPARATUS FOR MANUFACTURING COMPRESSION MOLDED ARTICLES FROM THERMOPLASTIC MATERIAL

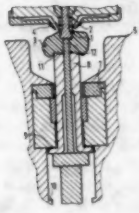
Gerhard Keller, Jongny, and Andreas Iseli, Ollon, both of Switzerland, assignors to AISA Automation Industrielle S.A., Vouvry, Switzerland

Filed Feb. 13, 1989, Ser. No. 310,354

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804464

Int. Cl.[5] B29C *43/02*

U.S. Cl. 264—322 **7 Claims**



1. In a method for manufacturing compression molded articles from thermoplastic material wherein the material is heated, a blank is compression molded by means of a die, the blank is separated from the die and introduced in a mold which is then closed, the blank is then compression molded by the application of a compression molding pressure, and the molded article cooled at least partly under pressure, the improvement comprising:

depositing the heated thermoplastic material forming the blank on the surface of an intermediate support which surface being a part of the closed compression molding mold and which extends beneath the die and is separated therefrom, and lowering the intermediate support as the mold closes.

4,943,406

METHOD FOR PRODUCTION OF CONTAINERS IN THERMOPLASTIC MATERIAL, IN PARTICULAR SHEETS OF POLYETHYLENE-TEREPHTHALATE

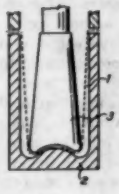
Luigi Bocchi, Via Dei Cignoli, 1 – 20151 Milano, Italy

Continuation-in-part of Ser. No. 76,062, Jul. 21, 1987, abandoned. This application Jun. 15, 1989, Ser. No. 366,688

Claims priority, application Italy, Jul. 31, 1986, 21353 A/86

Int. Cl.[5] B29C *51/04, 51/42*

U.S. Cl. 264—522 **3 Claims**



1. A method of production of a container of polyethyleneterephthalate stretched in the longitudinal and radial direction from a sheet of amorphous, polyethyleneterephthalate which consists of the following steps:

(a) preheating the sheet of amorphous, polyethyleneterephthalate to such a temperature that said sheet is preheated, softened and may be drawn;

(b) placing said sheet in a die having a female mold and a male plug, said male plug having a truncated cone shape with side surfaces upwardly converging; said female mold having a bottom and side walls;

(c) heating said female mold to a temperature of about 175°–180° C.;

(d) heating said male plug to a temperature of about 160°–166° C.;

(e) drawing said preheated sheet into contact with the bottom of said female mold by pressing with said male plug and longitudinally drawing the sheet whereby only the drawn bottom part crystallizes in contact with the bottom of said female mold;

(f) introducing compressed air or inert gas into the space between the female mold and said sheet, to cause said sheet to adhere to the male plug;

(g) introducing then compressed air or inert gas into the space between said male plug and said sheet, whereby said sheet separates from the sides of the male plug, comes in contact with the heated surface of the female mold, stretching in the radial direction occurs, the sheet crystallizes and the container of polyethyleneterephthalate stretched in the longitudinal and radial direction is obtained;

(h) cooling said container from step (g) and withdrawing it from the die.

4,943,407

METHOD OF AND APPARATUS FOR INJECTION MOLDING WITH PRESSURIZED FLUID ASSIST

James W. Hendry, Brooksville, Fla., assignor to Michael Ladney, Sterling Heights, Mich.

Continuation-in-part of Ser. No. 98,862, Sep. 21, 1987, Pat. No. 4,855,094. This application Aug. 25, 1988, Ser. No. 235,435

Int. Cl.[5] B29C *45/00, 45/34;* B29D *22/00*

U.S. Cl. 264—572 **55 Claims**

1. An apparatus for the injection molding of plastic articles comprising:

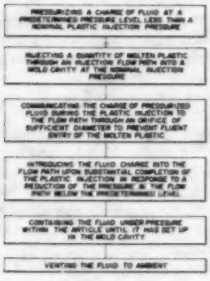
an injection molding machine for injecting molten plastic through a nozzle into a flow path at a nominal injection molding pressure;

a mold having a cavity defining the shape of the molded article and at least one plastic entry point coupled to the plastic flow path;

fluid charge means for pressurizing a charge of fluid at a predetermined level no greater than the nominal injection pressure; and

fluid circuit means, interconnecting the flow path and the fluid charge means, for communicating the charge of fluid to the flow path during plastic injection and responding to a pressure reduction in the flow path below the predetermined level of pressure to introduce the fluid charge into the flow path wherein the fluid circuit means interconnects the flow path downstream of the nozzle of the injection molding machine and proximate a mold sprue communicative with the flow path and wherein the machine nozzle communicates with a bushing in the sprue, and the fluid charge is communicated to an orifice in the sprue bushing.

16. A method for the injection molding of a plastic article in an injection molding system including a resin injection nozzle and a mold having an injection aperture for receiving molten resin from the nozzle at an upstream position, a mold cavity at a downstream position and a resin flow path for fluidly communicating the injection aperture and the mold cavity between the upstream and downstream positions, the method comprising the steps of:


PRESSURIZING A CHARGE OF FLUID AT A PREDETERMINED PRESSURE LEVEL LESS THAN A NOMINAL PLASTIC INJECTION PRESSURE
INJECTING A QUANTITY OF MOLTEN PLASTIC THROUGH AN INJECTION FLOW PATH INTO A MOLD CAVITY AT THE NOMINAL INJECTION PRESSURE
COMMUNICATING THE CHARGE OF PRESSURIZED FLUID DURING THE PLASTIC INJECTION TO THE FLOW PATH THROUGH AN ORIFICE OF SUFFICIENT DIAMETER TO PREVENT FLUENT ENTRY OF THE MOLTEN PLASTIC
INTRODUCING THE FLUID CHARGE INTO THE FLOW PATH UPON SUBSTANTIAL COMPLETION OF THE PLASTIC INJECTION IN RESPONSE TO A REDUCTION OF THE PRESSURE IN THE FLOW PATH BELOW THE PREDETERMINED LEVEL
CONTAINING THE FLUID UNDER PRESSURE WITHIN THE ARTICLE UNTIL IT HAS SET UP IN THE MOLD CAVITY
VENTING THE FLUID TO AMBIENT

pressurizing a charge of fluid at a predetermined pressure level;

injecting a quantity of molten plastic from the injection nozzle through the injection aperture and the flow path and into the mold cavity at a nominal plastic injection pressure;

communicating the charge of pressurized fluid to an orifice opening to the resin flow path in the mold between the upstream and downstream positions;

introducing the fluid charge into the flow path from the orifice to distribute the molten plastic within the mold cavity;

preventing the introduced fluid charge from traveling from the flow path, through the injection aperture and into the injection nozzle;

containing the fluid under pressure within the article until it has set up in the mold cavity; and

venting the fluid to ambient wherein the mold includes valve means movable between fluid open and fluid closed positions, the valve means allowing the fluid charge to travel through the orifice and into the flow path in the fluid open position and preventing the flow of the fluid charge through the orifice and into the flow path in the fluid closed position.

4,943,408

METHOD AND APPARATUS FOR OPERATING NUCLEAR ELECTRIC POWER GENERATING PLANTS

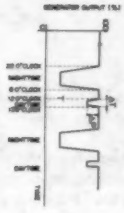
Fumiaki Yamamoto, Yokohama; Tsutomu Otsuka, Atsugi, and Yasuo Funo, Chiba, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Jul. 10, 1985, Ser. No. 754,144

Claims priority, application Japan, May 21, 1980, 55-67444

Int. Cl.[5] G21L *7/36*

U.S. Cl. 376—210 **6 Claims**



1. A method of load variation follow up running of a nuclear electric power generating plant connected to an electric power system including a hydroelectric power generating station and a steam electric power generating station, said power system further including at least said nuclear power generating plant connected thereto, said nuclear power generating plant including a nuclear reactor which is operated during first and second successive time intervals which together form a 24-hour day, said first interval including a period of a day when a demand load on said power system is at a highest demand load level during said 24-hour day and said second interval including a period of a day when a demand load on said power system is at a lowest demand load level during said 24-hour day, said method comprising the steps of:

(a) operating said nuclear reactor for driving said nuclear electric power generating plant at a first output level during a said first interval of a given 24-hour day;

(b) decreasing an output of said nuclear reactor from said first output level to a second output level during a said second interval of said given 24-hour day occurring during a period when there is a decrease in demand load on said power system from said highest demand load;

(c) increasing an output level of said nuclear reactor toward said first output level thereof during a said first interval of a next 24-hour day following said second interval of said given 24-hour day;

(d) temporarily decreasing an output of said nuclear reactor during a third interval of said given 24-hour day which is included within said first interval of said given 24-hour day, said third interval of said given 24-hour day occurring when a poisonous effect of fission products manifesting negative reactivity which is produced by a decreased output running of said nuclear reactor during step (b) becomes substantial; and

(e) increasing at least one of an amount and a duration of said decreased output running of said nuclear reactor during said second interval of said given 24-hour day in accordance with a decrease in an output of said nuclear reactor during an operation of said reactor during said third interval of said given 24-hour day.

4,943,409

REACTIVITY CONTROL IN NUCLEAR REACTORS

Donald Broadley, Warrington, United Kingdom, assignor to National Nuclear Corporation Limited, Knutsford, United Kingdom

Filed Feb. 29, 1988, Ser. No. 162,120
Claims priority, application United Kingdom, Mar. 31, 1987, 8707614
Int. Cl.[5] G21C 7/00, 9/00
U.S. Cl. 376—212 16 Claims

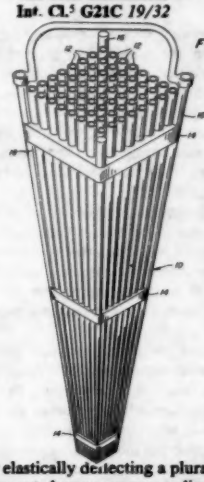
1. A fuel sub-assembly for a nuclear reactor, said sub-assembly comprising an elongated tubular housing having, at or adjacent opposite ends thereof, coolant inlet means and coolant outlet means respectively, a coolant traversable fuel-bearing region enclosed within the housing between the inlet means and the outlet means, means comprising at least one elongate element located within, and extending generally longitudinally of, the housing for undergoing differential longitudinal thermal expansion relative to said housing as the temperature of the coolant increases, and radially extensible means coupled to said elongate element and to said housing and responsive to differential longitudinal thermal expansion of said element relative to said housing for projecting beyond the outer periphery of the housing so as to effect, in use, relative displacement between the sub-assembly and a neighbouring sub-assembly or sub-assemblies.

4,943,410

COMPACTION APPARATUS FOR SPENT NUCLEAR FUEL RODS

William J. Wachter, Glenshaw, Pa., assignor to U.S. Tool & Die, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 291,230, Aug. 15, 1981, Pat. No. 4,775,507. This application Sep. 16, 1987, Ser. No. 97,045
The portion of the term of this patent subsequent to Nov. 3, 2004, has been disclaimed.
Int. Cl.[5] G21C 19/32
U.S. Cl. 376—261 15 Claims



9. A method for elastically deflecting a plurality of fuel rods from a first, uncompacted array corresponding to the spacing of fuel rods in a fuel rod assembly to a second, compacted array, including the steps of:

removing the ends of the fuel rod assembly;

positioning an entry end of a fuel rod directing chamber at one end of the fuel rod assembly, said fuel rod directing chamber having a final consolidation section remote from said entry end, said final consolidation section comprising only a wall formed by an outer periphery of the fuel rod directing chamber;

drawing said fuel rods through a means forming a plurality of cavities extending through said fuel rod directing chamber to thereby deflect the fuel rods into said compacted array at said final consolidation section; and

storing said compacted array of fuel rods in a fuel rod storage canister.

4,943,411

PROCESS FOR TREATING MOLTEN IRON WITH MAGNESIUM ADDITIONS

Ivo Henych, Stetten, and Rudolf Pavlovsky, Schaffhausen, both of Switzerland, assignors to Georg Fischer AG, Schaffhausen, Switzerland

Continuation-in-part of Ser. No. 349,642, May 10, 1989, Pat. No. 4,897,242. This application Nov. 2, 1989, Ser. No. 430,803
Claims priority, application Switzerland, Nov. 4, 1988, 04090/88-9
Int. Cl.[5] C01G 3/00
U.S. Cl. 423—566 9 Claims

1. A process for treating molten iron with magnesium comprising:

introducing a granular mixture into a holding vessel, said granular material comprising granular refractory material of controlled size and granular magnesium of controlled size wherein the granular size of said refractory material is controlled so that, but for the presence of said granular magnesium, said granular refractory material is prevented from rising in the melt due to its controlled size and the interfacial surface tension of the melt; and

feeding molten iron to said vessel in a controlled whirl-free manner whereby no significant eddies are produced whereby the granular magnesium exposed to said molten iron partially vaporizes and disturbs said interfacial surface tension of the melt thereby allowing said granular refractory material to rise in said melt so as to expose additional granular magnesium to said melt which in turn vaporizes thereby allowing for the controlled introduction of magnesium into said iron melt.

4,943,412

HIGH STRENGTH ALPHA-BETA TITANIUM-BASE ALLOY

Paul J. Bania, Boulder City, and Warren M. Parris, Las Vegas, both of Nev., assignors to Timet, Pittsburgh, Pa.

Filed May 1, 1989, Ser. No. 345,561
Int. Cl.[5] C22C 14/00
U.S. Cl. 420—420 2 Claims

1. An alpha-beta titanium-base alloy comprising in weight percent, 6 aluminum, 4 vanadium, 0.04 to 0.10 silicon and 0.03 to 0.08 carbon, said alloy having an increase in strength over that of the alloy absent said silicon and carbon additions.

4,943,413

PROCESS FOR PRODUCING AN ALUMINUM/MAGNESIUM ALLOY

Eggert Tank, Wernau, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Filed Feb. 2, 1989, Ser. No. 305,118
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1988, 3807541
Int. Cl.[5] C22C 1/03
U.S. Cl. 420—528 5 Claims

1. Process for producing an aluminum-containing alloy containing refractory material particles, comprising:

preparing a refractory material particles charge from any one of B_4C, Si_3N_4, SiC, Al_2O_3, 3 $Al_2O_32SiO_2$, Al_2O_3.-MgO or ZrO_2 in the pure form or in the form of mixtures of various such refractory materials;

then heating said refractory material particles charge to between 680 to 800° C. in a mold completely filled with said refractory material particles charge;

then preparing a pre-alloy in the mold by filling the voids existing between particles of the refractory material particles charge with either hot molten magnesium, or a mag-

nesium/aluminum alloy with up to 32% by weight of aluminum, at 680 to 800° C.;

and then dissolving this void filled pre-alloy in either an aluminum melt, or alloy that does not exceed a magnesium content of 11% by weight, relative to the metal fraction in the resulting alloy.

4,943,414

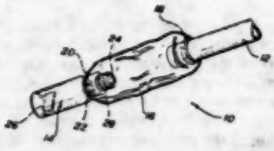
METHOD FOR VAPOR STERILIZATON OF ARTICLES HAVING LUMENS

Paul T. Jacobs; Ronald F. Berry, both of Arlington, and Toby A. Soto, Fort Worth, all of Tex., assignors to Johnson & Johnson Medical, Inc., Arlington, Tex.

Filed Jul. 30, 1987, Ser. No. 79,550

Int. Cl.[5] A61L *2/20*

U.S. Cl. 422—28 **10 Claims**



1. In a method for vapor sterilization of an article having a narrow lumen therein which comprises disposing the article within a chamber, evacuating the chamber, and introducing a first supply of antimicrobial vapor into said chamber to contact and sterilize said article, the improvement comprising connecting a vessel containing a second supply of antimicrobial solution to the lumen of said article prior to disposing the article in the chamber whereby antimicrobial vapor derived from said second supply of antimicrobial solution is introduced directly into said lumen of said article.

4,943,415

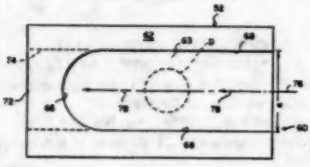
GROOVED COVER FOR TEST ELEMENTS

Catherine S. Przybylowicz, Rochester; Merrit N. Jacobs, Fairport, and Joseph S. Douglas, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 14, 1989, Ser. No. 380,839

Int. Cl.[5] G01N *35/00, 35/02*

U.S. Cl. 422—56 **4 Claims**



1. In a clinical analyzer for use with slide-like test elements spotted with a drop of patient sample, said analyzer including stations that follow a spotting station that places said drop onto each test element, at least some of said following stations including a cover having a surface in contact with each test element after it is spotted, and means for moving a test element a predetermined direction into each of said some stations from an exterior location to an interior location under said cover, said moving being done while the moved test element is in contact with said cover;

the improvement wherein at least one of said cover contact surfaces has a recessed groove extending from the cover edge adjacent to said exterior location, to said interior location, said groove (a) being closed at its end corresponding to said interior location, (b) having an orientation axis that parallels said predetermined movement direction, and (c) having a clearance and shape adequate to accommodate without contact any sample drop of a predetermined volume protruding from said test element, said groove being smaller in width than the width of a slide-like test element covered by said cover.

4,943,416

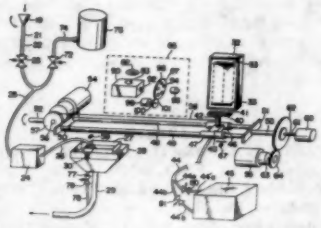
AUTOMATIC URINALYSIS SYSTEM

Makoto Kikuchi, Mitaka, and Manabu Harada, Tokyo, both of Japan, assignors to Kabushiki Kaisha Marukomu, Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,224

Int. Cl.[5] G01N *35/00*

U.S. Cl. 422—63 **21 Claims**



1. An automatic urinalysis system for use at an excretion site by a subject who desires to have their urine analyzed, comprising:

a sample collecting means for collecting a sample of urine directly from the subject during urination at an excretion site at which said automatic urinalysis system is installed and for taking the collected urine sample into said automatic urinalysis system;

a guiding means for receiving the urine sample directly from said sample collecting means and for introducing the urine sample into a testing area within a body of said automatic urinalysis system;

a urine testing element located within said body;

a contacting means for automatically contacting said urine testing element with the urine sample in the testing area;

a urine testing element measuring means for automatically measuring at least one parameter of said urine testing element contacted with the urine sample by said contacting means;

a display means for displaying test data from said urine testing element measuring means; and

a discharging means for discharging the urine sample to a discharge location after the urine sample has been contacted by said urine testing element;

said sample collecting means being provided within a urinal.

4,943,417

APPARATUS FOR DRY STERILIZATION OF MEDICAL DEVICES AND MATERIALS

Adir Jacob, 23 Juniper La., Framingham, Mass. 01701

Division of Ser. No. 19,134, Feb. 25, 1987, Pat. No. 4,801,427.

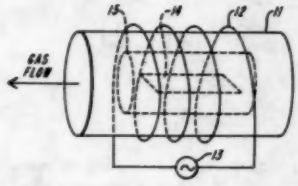
This application Nov. 22, 1988, Ser. No. 276,404

Int. Cl.[5] A61L *2/14*

U.S. Cl. 422—292 **4 Claims**

1. Apparatus for sterilization of medical devices and materials in a substantially continuous process in a gas plasma at or near atmospheric pressure comprising:

a first electrode suitable to form a corona discharge in a gas at or near atmospheric pressure,
a second generally planar electrode,
an RF power source connected between said first electrode and said planar electrode capable of producing a power density in ambient air of at least 5 Watts/cm^2, and
a conveyor means positioned in close contact with said



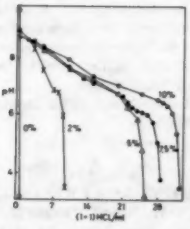
planar electrode for substantially continuously carrying said material to be treated through the discharge gap between the electrodes at or near atmospheric pressure,
said conveyor means including means for loading said material to be treated onto said conveyor means before it is carried through said discharge gap and for unloading said material from said conveyor means after it has been carried through said discharge gap.

4,943,418

METHOD OF PREPARING HIGH-PURITY MANGANESE COMPOUNDS

Koichi Kambe, Sakata; Kiyoshi Matsuura, Kiryu; Tatsuo Seino, Narashino; Yoshiyuki Kimura, Gunma; Hiroshi Kemmochi, Gunma; Koichi Yoshioka, Gunma, and Hideaki Hohnoki, Gunma, all of Japan, assignors to Japan Metals & Chemicals Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 137,333, Dec. 23, 1987, abandoned. This application May 30, 1989, Ser. No. 361,757
Claims priority, application Japan, Mar. 10, 1987, 62-54872; Mar. 10, 1987, 62-54871
Int. Cl.^{5} C01G *45/00*
U.S. Cl. 423—50 **22 Claims**



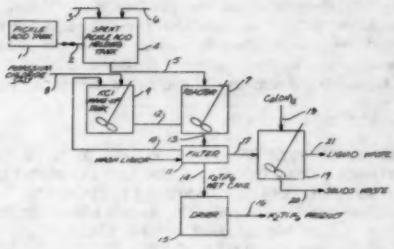
1. A method of preparing manganese compounds suitable as raw materials for ferrites, comprising adding at least one member selected from ferromanganeses and metallic manganeses to an aqueous buffered solution containing an electrolyte, dissolving said at least one member by the addition of an acid thereto while stirring and maintaining a pH 4 to 9 such that manganese is dissolved without substantial co-dissolution of an impurity selected from the group consisting of cobalt, calcium, chromium, mangesium, silicon, nickel, phosphorus, copper, and vanvadium, filtering said aqueous buffered solution to form a filtered aqueous solution, and then precipitating said manganese from said filtered aqueous solution.

4,943,419

PROCESS FOR RECOVERING ALKALI METAL TITANIUM FLUORIDE SALTS FROM TITANIUM PICKLE ACID BATHS

Joseph A. Megy, 3740 Chinquapin, Corvallis, Oreg. 97220

Continuation-in-part of Ser. No. 198,159, May 24, 1988, abandoned. This application Mar. 30, 1989, Ser. No. 331,583
Int. Cl.^{5} C01G *23/02*
U.S. Cl. 423—72 **59 Claims**



1. A process for recovering a substantially pure alkali metal fluorotitanate salt containing at least 19.5% titanium of controlled particle size of from 60 to 325 mesh from tetravalent titanium containing spent pickle acid liquors containing titanium alloying metals by first making small sized crytals which are converted to larger size product crystals which comprises the steps of:
(a) adding fluorine ion to tetravalent titanium-containing spent pickle acid liquor containing titanium alloying metals to adjust the fluorine to titanium mole ratio in said liquor to a value of about 5.5 to about 6.2 to obtain a prepared titanium containing spent pickle acid liquor;
(b) adjusting the temperature of the prepared titanium containing spent pickle acid liquor to between about 22° C. and 28° C.;
(c) adding, with agitation, an excess of alkali metal salt to the prepared titanium-containing spent pickle acid liquor to produce an alkali metal fluorotitanate product salt containing at least 19.5% titanium.
(d) filtering the resulting alkali metal fluorotitanate product salt from the solution of step (c);
(e) adding the alkali metal fluorotitanate salt to an aging solution of water or weak hydrofluoric acid and aging the salt in the solution longer than 20 minutes to reduce the impurities in the salt and refine the particle size of the salt to a particle size of from about 60 mesh to about 325 mesh;
(f) filtering the aged alkali metal fluorotitanate salt from the aging solution; and
(g) drying the filtered, aged alkali metal fluorotitanate salt.

4,943,420

PROCESS FOR RECOVERING GALLIUM

Alfred Mitschker, Odenthal-Holz; Peter M. Lange, Leverkusen; Heiko Hoffmann, Bergisch Gladbach; Günter Lossmann, Bonnl, all of Fed. Rep. of Germany; Andries P. van der Meer, Arnhem, and Cornelius J. Smit, Am Zevenaar, both of Netherlands, assignors to Bayer Aktiengesellschaft, Leverkusen and Ingal International Gallium GmbH, Schwandorf, both of, Fed. Rep. of Germany

Filed Apr. 13, 1989, Ser. No. 337,585
Claims priority, application Fed. Rep. of Germany, May 3, 1988, 3814916
Int. Cl.^{5} C01G *15/00*
U.S. Cl. 423—112 **7 Claims**

1. In a process for recovering gallium from an aqueous alkaline solution by adsorption of the gallium onto a bead-polymerized synthetic resin impregnated with 7-(4-ethyl-1-methyloctyl)-8-hydroxyquinoline and elution thereof with an

aqueous solution of a mineral acid, the improvement which comprises (a) using as the synthetic resin a macroporous polydivinylbenzene polymer or a macroporous divinylbenzene copolymer, which polymer or copolymer has been obtained by bead polymerization of divinylbenzene or respectively of a mixture comprising two or three vinylbenzenes selected from the group consisting of aromatic mono-, di- and trivinylbenzene, containing at least 50% by weight of divinylbenzene, in the presence of a methyl C_2–C_6-alkyl ketone, (b) loading the polymer or copolymer with 160–190 g of 7-(4-ethyl-1-methyloctyl)-8-hydroxyquinoline per liter of (dry) resin; and (c), after the gallium has been eluted and the acid has been expelled from the resin bed by washing with water, washing the resin with an aqueous sodium hydroxide solution and only then beginning the next service cycle with the loading step.

4,943,421

METHOD OF REDUCING THE OXIDES OF NITROGEN IN FOSSIL FUELS COMBUSTION AND COMBUSTION EFFLUENTS USING AMINE COMPOUNDS

Otto C. Turchan, 458 El Camino Dr., Beverly Hills, Calif. 90212

Filed Mar. 16, 1989, Ser. No. 324,574
Int. Cl.[5] B01J *8/00*; C01B *21/00*
U.S. Cl. 423—235 **1 Claim**

1. A process for the reduction of oxides of nitrogen formed in the combustion of fossil fuels, within a fuel combustion reaction zone of a fossil fuels fired combustion apparatus or combustion device, the said oxides of nitrogen reduction process comprising: the step of interjecting an admixture of oxides of nitrogen reducing agents consisting essentially of methylamine, ethylamine, ethylenediamine, diethylenetriamine, aniline, monoethylaniline, toluidine and xylidine, interjected individually or in any combination into the said fuel combustion reaction zone containing combustion fuel, combustion air and products of fuel combustion, including said oxides of nitrogen generated in the combustion of said fossil fuels, wherein the said admixture of oxides of nitrogen reducing agents react with the said oxides of nitrogen generated within the said fuel combustion reaction zone, converting the oxides of nitrogen by the reduction process with said mixture of oxides of nitrogen reducing agents, to harmless molecular N_2 and H_2O in the fossil fuels combustion products effluents discharged to the ambient atmosphere from said fossil fuels fired combustion apparatus or combustion device and wherein a fossil fuels combustion apparatus or combustion device uses a liquid fossil fuel for combustion, and the said admixture of oxides of nitrogen reducing agents is blended into said liquid fossil fuels, wherein the resulting combination of said admixture of oxides of nitrogen reducing agents intermixed with said liquid fossil fuels is delivered into the combustion reaction zone of said combustion apparatus or combustion device, in combination with said liquid fossil fuels.

4,943,422

PROCESS FOR TREATMENT OF GASEOUS EFFLUENTS CONTAINING SULFUR DIOXIDE WITH OXYGEN

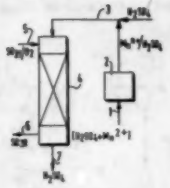
Henry Ledon, Lyons; Jean Louise, Villejuif, and Panayotis Cocolios, Limours, all of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation Des Procedes Georges Claude, Paris, France

PCT No. PCT/FR88/00104, § 371 Date Sep. 12, 1988, § 102(e) Date Sep. 12, 1988, PCT Pub. No. WO88/06483, PCT Pub. Date Sep. 7, 1988
PCT Filed Feb. 24, 1988, Ser. No. 275,135
Claims priority, application France, Feb. 25, 1987, 87 02491
Int. Cl.[5] C01B *17/00*
U.S. Cl. 423—242 **6 Claims**

1. A process for treatment of gaseous effluents containing sulfur dioxide to provide improved purification efficiency comprising:

providing an oxidation zone impregnated with concentrated sulfuric acid containing a catalyst generated by electro-oxidation of manganese salts having a valence of +2;

selecting the amount of sulfur dioxide and manganese as a function of the sulfur dioxide content of the gaseous effluents to be treated; and



contacting said gaseous effluents with a sulfuric acid solution in the presence of oxygen containng a small amount of ozone and a catalytic base of manganese salts.

4,943,423

PROCESS FOR RECOVERING BORON TRIFLUORIDE FROM AN IMPURE GASEOUS BORON TRIFLUORIDE RESIDUE

Francis E. Evans, Hamburg, N.Y.; Kenneth H. Schroeder, Wilmington, Del., and William J. Wagner, Hamburg, N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 29, 1988, Ser. No. 277,153
Int. Cl.[5] C01B *35/06, 17/90*
U.S. Cl. 423—293 **8 Claims**

1. A method for removing sulfur dioxide from a boron trifluoride stream comprising the steps of:

(a) condensing a gaseous boron trifluoride stream;

(b) distilling said condensed boron trifluoride stream to yield pure boron trifluoride and a liquid boron trifluoride residue wherein said liquid boron trifluoride residue comprises by weight: about 40 to about 95% boron trifluoride, about 5 to about 30% sulfur dioxide, about 0 to 19% sulfur trioxide, about 0 to about 0.2% silicon fluoride, about 0 to about 1.0% arsenic fluoride, and about 0 to about 0.1% antimony fluoride;

(c) vaporizing said liquid boron trifluoride residue;

(d) feeding said gaseous boron trifluoride residue into a mixture of boric and sulfuric acids wherein said acid mixture comprises by weight about 1 to about 30% boric acid and about 70 to about 99% sulfuric acid and absorbs boron trifluoride from said gaseous boron trifluoride residue and only slightly absorbs sulfur dioxide from said gaseous boron trifluoride residue; and

(e) removing said unabsorbed sulfur dioxide from said acid mixture.

4,943,424

SYNTHESIS OF A CRYSTALLINE SILICOALUMINOPHOSPHATE

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

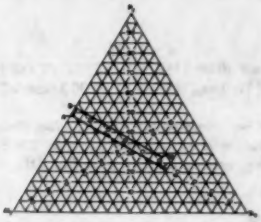
Filed Feb. 12, 1988, Ser. No. 155,191
Int. Cl.[5] C01B *33/26*
U.S. Cl. 423—328 **19 Claims**

2. A crystalline silicoaluminophosphate molecular sieve having a composition in terms of mole ratios of oxides on an anhydrous basis expressed by the formula:

$$mR:Al_2O_3:nP_2O_5:qSiO_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the moles of "R" present and has a value such that there are from 0.02 to 2 moles of R per mole of aluminum; n has a value of

from 0.96 to 1.1, and q has a value of from 0.1 to 4, said silicoaluminophosphate having a characteristic X-ray powder diffraction pattern which contains at least the d-spacings of Table I, and wherein the P_2O_5 to alumina mole ratio of the surface of the silicoaluminophosphate is about 0.80 or less, the



P_2O_5 to alumina mole ratio of the bulk of the silicoaluminophosphate is 0.96 or greater, and the SiO_2 to alumina mole ratio at the surface of the silicoaluminophosphate is greater than the SiO_2 to alumina mole ratio in the bulk of the silicoaluminophosphate.

4,943,425

METHOD OF MAKING HIGH PURITY DENSE SILICA OF LARGE PARTICLE SIZE

Sophia R. Su, Weston, and Leo F. Fitzpatrick, Sandwich, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 1, 1988, Ser. No. 176,583
Int. Cl.[5] C01B *33/02*
U.S. Cl. 423—338 **9 Claims**

1. A method of making silica comprising the following steps:

Step 1—homogeneously mixing tetraalkylorthosilicate with a solvent to form a solution having a molar ratio of said tetraalkylorthosilicate to said solvent of about 1 to about 3;

Step 2—adding the product of step 1 to an acid solution said acid solution at a pH of approximately 2.25;

Step 3—digesting the product of step 2;

Step 4—adding ammonium hydroxide to the product of step 3 to form a gel containing water and said solvent;

Step 5—screening the product of step 4 to form a granulated gel containing water and said solvent;

Step 6—heating under vacuum the product of step 5 for a period sufficient to remove any contained water and said solvent from the product of step 5 to form a dehydrated product;

Step 7—heating the product of step 6 to form [a large particle size, high purity, dense] silica having a particle size from about 100 micrometers to about 420 micrometers and a surface area from about 0.088 to about 0.20 m^2/g, said silica having an impurity content of less than 1.5 ppm.

4,943,426

METHOD FOR REGULATING REACTION TEMPERATURE

LeRoy E. Dastolfo, Jr., Lower Burrell, and Vito Cedro, III., Export, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

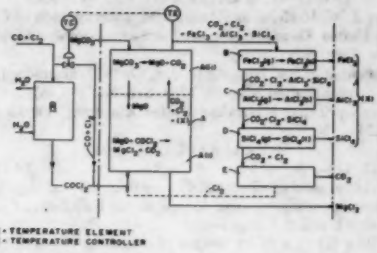
Filed Jun. 20, 1988, Ser. No. 208,657
Int. Cl.[5] C01F *5/32*
U.S. Cl. 423—497 **5 Claims**

1. A method for lowering the offgas temperature in a reactor for producing magnesium chloride from magnesium carbonate, carbon monoxide and chlorine, said method comprising:

(a) diverting at least some carbon monoxide and chlorine from the reactor to a continuously-cooled vessel;

(b) combining the carbon monoxide and chlorine in said vessel to exothermally produce phosgene;

(c) continuously cooling the vessel; and



(d) transferring phosgene from said vessel to the reactor containing magnesium carbonate.

4,943,427

DIAGNOSTIC AGENT FOR HEART DISEASE AND USE THEREOF

Yoshio Yazaki, Tokyo, and Masahito Sugi, Chosbi, both of Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Chiba, Japan

Filed Mar. 25, 1985, Ser. No. 715,815
Claims priority, application Japan, Mar. 27, 1984, 59-58767
The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.
Int. Cl.[5] A61K *43/00, 39/395, 49/02*; G01N *33/53*
U.S. Cl. 424—1.1 **8 Claims**

1. A diagnostic agent for heart disease comprising a radiolabeled monoclonal antibody having specificity to human cardiac myosin heavy chain or its active fragment.

4,943,428

STIMULATION OF SEROTONIN-1A RECEPTORS IN MAMMALS TO ALLEVIATE MOTION SICKNESS AND EMESIS INDUCED BY CHEMICAL AGENTS

James B. Lucot, Xenia, Ohio, and George H. Crampton, Oak Harbor, Wash., assignors to Wright State University, Dayton, Ohio

Continuation-in-part of Ser. No. 71,896, Jul. 10, 1987. This application Feb. 16, 1988, Ser. No. 156,527
Int. Cl.[5] A61K *27/00, 31/135*
U.S. Cl. 424—10 **13 Claims**

1. A method for the alleviation of motion sickness, which comprises administering a nontoxic, therapeutically effective dose of 8-hydroxy-2(di-n-propylamino)-tetralin to a mammal in need of such treatment.

4,943,429

DENTIFRICE GELS CONTAINING SODIUM BICARBONATE

Anthony E. Winston, East Brunswick, and Regina M. Miskewitz, Hillsborough, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed May 23, 1988, Ser. No. 197,218
Int. Cl.[5] A61K *7/16, 7/18*
U.S. Cl. 424—52 **12 Claims**

1. A dentifrice gel comprising a sodium bicarbonate abrasive in an aqueous carrier, the sodium bicarbonate having a median particle size range of from 10 to 200 microns and being incorporated in the gel in an amount of from 5 to 60% by weight of the gel, and the carrier incorporating a humectant selected from the group consisting of glycerin, sorbitol, a low molecular weight polyethylene glycol, propylene glycol, and mixtures

thereof in an amount of from 15 to 60% by weight of the gel and in at least a 0.5:1 ratio relative to the water content thereof.

4,943,430

TREATMENT OF KERATINOUS FIBRES

Robert J. W. Hefford, and Andrew M. Murray, both of Cheshire, United Kingdom, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 74,838, Jul. 17, 1987, abandoned. This application May 30, 1989, Ser. No. 358,467

Claims priority, application United Kingdom, Jul. 30, 1986, 8618634

Int. Cl.[5] A61K *7/13, 7/06*

U.S. Cl. 424—70 14 Claims

1. An aqueous, substantially organic solvent-free single phase composition, suitable for use in the treatment of keratinous fibres, which comprises:

(i) from 0.1 to 10% by weight of a cationic polymer having a cationic charge density of at least 0.001 selected from the group consisting of:
poly (dimethyldiallylammonium chloride);
poly (dimethylbutanylammonium chloride)-60 , ω-bis (triethanolammonium chloride)
poly (dipropyldiallylammonium chloride);
poly (methyl-β-propaniodiallyl ammonium chloride);
poly (diallylpiperidinium chloride);
poly (vinylpyridinium chloride);
quaternised poly (vinyl alcohol);
quaternised (dimethylaminoethylmethacrylate);
poly (n-vinyl pyrrolidone);
poly (dimethylaminoethylmethacrylate);
Polyquaternium - 2;
poly (vinylpyridine);
poly (ethyleneimine);
and mixtures thereof;

(ii) from 0.01 to 10% by weight of an anionic monomer selected from the group consisting of anionic dyes, anionic sunscreen agents, and mixtures thereof;

(iii) from 0.1 to 20% by weight of amphoteric detergent active compound;

(iv) from 1 to 30% by weight of an inorganic electrolyte selected from the group consisting of alkali metal, alkaline earth metal, ammonium and substituted ammonium, -chlorides, -bromides, -nitrates, the composition having an anionic to cationic charge ratio of from 0.2 to 1.0.

4,943,431

EMULSIFIED HAIR COSMETIC

Masaki Awamura, Takatsuki; Kazushi Yamamoto, Osaka, and Masashi Nanjo, Kawanishi, all of Japan, assignors to Sunstar Kabushiki Kaisha, Osaka, Japan

Filed Dec. 19, 1988, Ser. No. 286,638

Claims priority, application Japan, Dec. 24, 1987, 62-329340

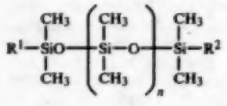
Int. Cl.[5] A61K *7/08, 7/06*

U.S. Cl. 424—70 2 Claims

1. An emulsified hair cosmetic which comprises

(i) a dimethylsilicone rubber of the formula:

[I]



wherein R^1 and R^2 are methyl or hydroxyl and n is an integer of 4000 to 9000;

(ii) one or more polyalcohols selected from the group consisting of propylene glycol, 1,3-butylene glycol and glycerin; and

(iii) one or more nonionic surfactants selected from the group consisting of polyoxyethylene oleyl ether, polyoxyethylene cetyl ether, ethylene glycol stearate, diethylene glycol stearate, polyethylene glycol stearate, polyethylene glycol distearate and glyceryl stearate, the total amount of (iii) being not more than 4 times the amount of (i) and not being less than 0.5 times the amount of (ii) and not more than twice the amount of (ii).

4,943,432

SALT MIXTURE FOR THE TREATMENT OF PSORIASIS

Hans F. Biener, Heilman Strasse 21, 8000 Munich 71, Fed. Rep. of Germany

Continuation of Ser. No. 916,279, Oct. 7, 1986, abandoned. This application Aug. 24, 1988, Ser. No. 236,513

Claims priority, application European Pat. Off., Oct. 8, 1985, 85112766.2

Int. Cl.[5] A61K *33/30*

U.S. Cl. 424—647 16 Claims

1. A composition for the treatment of psoriasis by application to the skin, said composition prepared by forming a mixture of salt components such that the salt components are present in the mixture in the following proportions, expressed as grams/kilogram of salt mixture in the ionic state:

Cations (g./kg salt mixture)		Anions (g./kg salt mixture)	
magnesium	55 to 108	chloride	340 to 550
sodium	51 to 126	bromide	1.5 to 15
calcium	19 to 36	sulfate	1.1 to 9
potassium	10 to 21	borate	0.4 to 3
strontium	0.2 to 2.0	silicate	0.1 to 2.9
iron	0.18 to 1.9	fluoride	0.1 to 2.2
aluminum	0.006 to 1.2	iodide	0.1 to 2.0
zinc	0.02 to 0.8	carbonate	0.01 to 1.0
lithium	0.004 to 0.7	hydrogen carbonate	0.01 to 1.0

said composition further characterized as being essentially free of organic impurities.

4,943,433

PHARMACOLOGICAL/COSMETIC PREPARATION

David Rudov, 6 Tracey Crescent, Brighton, Victoria, 3186, Australia

Filed Nov. 30, 1987, Ser. No. 126,603

Claims priority, application Australia, Dec. 3, 1986, PH9306; Sep. 23, 1987, PI4530

Int. Cl.[5] A61K *35/78*

U.S. Cl. 424—195.1 10 Claims

1. A pharmacologically effective substance for external application, the substance including an extract consisting of a pharmaceutically acceptable and substantially bacteria-free liquid comprising water and substantially only water soluble components from a juice which has been freshly derived from plants at the unjointed stage of plant development, the plants being selected from barley, wheat, oats, rice, rye and other cereal plants,

(a) the extraction being by a squeezing, crushing and/or grinding process,

(b) the extraction being carried out under sterile conditions and/or the extract being treated to prevent or inhibit growth, reproduction or activity of contaminating microorganisms,

(c) the extract being carried in a pharmaceutically acceptable base carrier or excipient, the carrier preserving the extract against deterioration and being capable of at least partial absorption by tissues so as to carry the extract to sub-surface tissues.

4,943,434

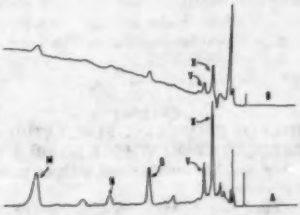
INSECTICIDAL HYDROGENATED NEEM EXTRACTS

Zev Lidert, Doylestown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 106,755, Oct. 6, 1987, abandoned. This application Sep. 2, 1988, Ser. No. 240,790

Int. Cl.[5] A01N *65/00*

U.S. Cl. 424—195.1 29 Claims



1. Hydrogenated crude extract of seeds of the neem tree *Azadirachta indica.*

4,943,435

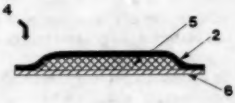
PROLONGED ACTIVITY NICOTINE PATCH

Richard W. Baker, Palo Alto; Frank Kochinke, Fremont, and Carl Huang, Palo Alto, all of Calif., assignors to Pharmetrix Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 105,549, Oct. 5, 1987, Pat. No. 4,839,174. This application Oct. 28, 1988, Ser. No. 264,397

Int. Cl.[5] A61L *15/00*

U.S. Cl. 424—448 22 Claims



1. A transdermal patch, comprising:

(a) A nicotine depot layer, having a skin-facing side and a skin-distal side, said depot layer containing a sufficient quantity of nicotine to maintain a useful flux of nicotine from said patch for a total time period of 12 hours or more;

(b) an occlusive backing layer in contact with and covering said depot layer on said skin-distal side; and

(c) rate-controlling means for controlling diffusion of nicotine from said skin-facing side at a first flux of greater than zero but less than 2 mg/cm^2 in any hour for a first time period of greater than zero but less than 5 hours, then at a second flux between 20 and 800 μg/cm^2.h for a second time period of 7 hours or more.

4,943,436

BEER PRODUCTION

Ian E. Ogden, 53 Makara Road, Karori, Wellington, New Zealand

Continuation of Ser. No. 69,897, Jul. 6, 1987, abandoned, which is a continuation of Ser. No. 733,133, May 10, 1985, abandoned. This application Mar. 21, 1989, Ser. No. 326,470

Claims priority, application New Zealand, May 11, 1984, 208134

Int. Cl.[5] C12C *7/00, 11/04*

U.S. Cl. 426—16 6 Claims

1. In a process for the production of a low-alcohol beer wherein a wort is produced by the mashing of barley, said wort being combined with hops, additional carbohydrates and flavoring agents and subsequently fermented with yeast to obtain a beer, the improvement comprising subjecting the wort, prior to fermentation, to ultrafiltration through a membrane effective to permit passage of mono-, di-, and trisaccharides thereby producing (1) a retentate as a first product having a lower quantity of low molecular weight components than said wort prior to said ultrafiltration and (2) a permeate as a second product richer in fermentable low molecular weight components then said wort; and fermenting said first product to produce a low alcohol beer.

4,943,437

PROCESS FOR SUPPLY OF BIOLOGICALLY ACTIVE MATERIALS TO EASE MATERIALS

Endre Kvants; Anders Pedersen, and Lars Alexandersson, all of Ängelholm, Sweden, assignors to AB Medipharm, Ängelholm, Sweden

Filed Apr. 6, 1987, Ser. No. 38,936

Claims priority, application Sweden, Apr. 7, 1986, 8601543

Int. Cl.[5] A23K *1/165*

U.S. Cl. 426—61 12 Claims

1. A process for supplying low concentrations, of the order of parts per million, of biologically active materials to base materials comprising: (a) forming a slurry of said biologically active material and an inert liquid carrier, said carrier being of opposite polarity to said biologically active material, (b) blending said slurry to form a homogeneous suspension in which said suspended biologically active material is evenly distributed throughout said carrier, and (c) applying said suspension to said base material by atomizing said suspension and supplying the thus atomized particles of the suspension to the base material so that the surface of said material is evenly coated by said suspension.

4,943,438

BREAD CRUMB COATING COMPOSITION AND PROCESS FOR IMPARTING FRIED-LIKE TEXTURE AND FLAVOR TO FOOD PRODUCTS

Sallie W. Rosenthal, Manchester, Mo., assignor to ConAgra, Inc., Omaha, Nebr.

Continuation of Ser. No. 882,236, Jul. 7, 1986, abandoned. This application Feb. 21, 1989, Ser. No. 314,224

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—92 15 Claims

1. A method of preparing food products which produces in said food products, when reheated by microwave or conventional baking, a flavor, texture, and appearance produced by frying said food products, comprising the steps of:

(a) coating an initial food product with a binding agent;

(b) breading the coated product with a breading crumb mixture comprising extruded flour dough breading crumbs, said flour dough breading crumbs being made from dough comprising 2–6% rice flour, 2–6% corn flour, 2–6% wheat flour and 2–6% malted barley extract, and said crumbs being formed by an extrusion process which removes most of the moisture from the dough;

(c) baking the breaded product in a humidified oven;

(d) applying edible oil in atomized form to the surface of the baked product; and then

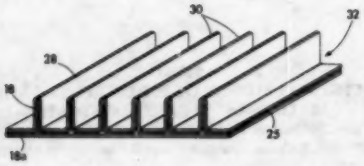
(e) exposing the baked product surface to high temperature heating, said oil and heating being supplied in amounts sufficient to provide a brown, crisp and fried-like appearance to the breaded product.

4,943,439

MICROWAVE RECEPTIVE HEATING SHEETS AND PACKAGES CONTAINING THEM

David W. Andreas, Minneapolis, and David H. Cox, Robbinsdale, both of Minn., assignors to Golden Valley Microwave Foods Inc., Edina, Minn.

Filed Mar. 15, 1988, Ser. No. 169,215
Int. Cl.[5] A23L *1/025*; H05B *6/80*; B65D *81/34*
U.S. Cl. 426—107 **12 Claims**



1. A microwave heating package including an outer microwave transparent packaging enclosure, food pieces contained therein and an inner microwave receptive heating sheet for heating the food pieces, said sheet being located within the package and contained within the enclosure,

said sheet comprising a backing and a microwave receptive heating material associated therewith,

said sheet being formed into a plurality of longitudinally extending, laterally spaced apart heat emitting partitions separating food pieces and defining a honeycomb-like array comprising a plurality of food compartments, each of said compartments enclosing said food pieces on more than two sides of each piece with the microwave receptive sheet to heat adjacent surfaces of each food piece so as to toast, brown or crisp them when exposed to microwave energy within a microwave oven by transfer of heat from the microwave receptive sheet to the surfaces of the food pieces.

4,943,440

CONTROLLED ATMOSPHERE CUT VEGETABLE PRODUCE PACKAGE AND METHOD

Glenn S. Armstrong, Plymouth, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Continuation of Ser. No. 921,502, Oct. 22, 1986, abandoned. This application Feb. 28, 1989, Ser. No. 318,432
Int. Cl.[5] A23B *7/148*; B65D *81/20*
U.S. Cl. 426—118 **20 Claims**

1. A packaged food article for the extended refrigerated storage of cut fresh vegetable produce pieces, comprising;

A. a sealed imperforate container;

B. a quantity of a perishable fresh vegetable produce consisting essentially of a blend of ripe garden salad vegetables other than tomatoes, green peppers, red peppers, radishes, sprouts, mushrooms or cucumbers, in the form of cut pieces disposed within the container forming a produce bed having a bed depth ranging from about 1 to 6 inches,

wherein the produce pieces each range in weight from about 1 to 10 g,

said produce blend having at the time of packaging in said container an initial microbial load of less than about 1000 APC per gram of blend,

said produce blend being a mixture of a plurality of vegetable species,

wherein the container has an initial atmosphere at atmospheric pressure upon sealing within said container consisting essentially of

1. about 1.5% to 7% by volume oxygen,
2. about 8% to 15% by volume carbon dioxide, and
3. the balance being substantially all molecular nitrogen,

wherein the container has a portion fabricated from a gas permeable material sufficient to allow infusion into the package of about 18 to 32 cc of oxygen per day per ounce of the produce blend and wherein the container is substantially free of chemical agents capable of absorbing gases.

wherein the package is refrigerated,

said container and produce blend being selected such that the container has an equilibrium atmosphere within said container comprising

about 0.8% to 1.5% by volume oxygen,

about 8% to 12% by volume carbon dioxide, and the balance substantially all molecular nitrogen, said equilibrium atmosphere being obtained within one to five days of being sealed and refrigerated.

4,943,441

METHOD OF PRODUCING SIMULATED MEAT PRODUCT FROM WHOLE SOYBEANS

Edward M. McCabe, Marysville, Ohio, assignor to Nestec S. A., Vevey, Switzerland

Filed Mar. 3, 1989, Ser. No. 318,793
Int. Cl.[5] A23J *3/22*
U.S. Cl. 426—511 **20 Claims**

1. A method of processing whole soybeans to produce a textured soy protein product in the form of discrete chunks free from off-flavors and odors, which consists essentially of

hydrating and acidifying whole soybeans to a pH in the range of between about 4.5 to 6.5,

comminuting the hydrated and acidified whole soybeans to provide an aqueous dispersion of soybean particles having a pH in the range of between about 4.5 to 6.5,

introducing the aqueous dispersion having a solids content of between about 10% to 45% by weight and up to 45% protein on a moisture free basis into a confined treatment zone,

injecting pressurized steam into a confined stream of the aqueous dispersion in said treatment zone under conditions sufficient to rapidly denature soy protein in said dispersion and texturize the protein into discrete chunks of texturized soy protein, and

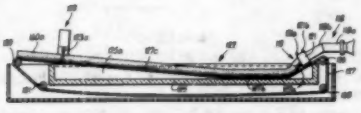
discharging the texturized protein from said treatment zone in the form of discrete, chunks which are free of off-flavors and odors.

4,943,442

METHOD AND APPARATUS FOR CRUST-FREEZING AND SLICING OF COMMINUTED MEAT PRODUCTS

Warren R. Schack, Leawood, and Richard G. Powers, Overland Park, both of Kans., assignors to Marlen Research Corporation, Overland Park, Kans.

Continuation-in-part of Ser. No. 180,309, Apr. 12, 1988, abandoned. This application Aug. 26, 1988, Ser. No. 236,831
Int. Cl.[5] A22C *7/00*; A23P *1/00*
U.S. Cl. 426—513 **26 Claims**



1. A method of forming a comminuted meat product without the use of a casing, said method comprising the steps of:

supplying an elongated, preformed body of comminuted meat in an uncased, peripherally unrestrained condition;

crust-freezing said meat body in said uncased, peripherally unrestrained condition to render the body substantially shape-retaining and to form a continuous, circumscribing frozen peripheral meat crust extending the full length of the body, and a non-frozen central meat portion,

said crust-freezing step including the step of causing direct

contact between the outer surface of the meat body and a freezing fluid; and

substantially immediately subdividing said crust-frozen meat body before the body is allowed to substantially temper and while the body substantially retains said crust-frozen condition with said frozen crust and non-frozen central meat portion, said subdividing step comprising subdividing the body in a direction generally transverse to the longitudinal axis of the body and through said circumscribing frozen meat crust, to yield said meat product.

4,943,443

FOAMABLE ALCOHOL PRODUCT AND PROCESS OF PRODUCING A FOAMABLE ALCOHOL PRODUCT

Paulus H. J. M. Evers, Creytestraat 11, 5841 AL Oploo, Netherlands

Filed Apr. 18, 1988, Ser. No. 182,972

Claims priority, application Netherlands, Apr. 22, 1987, 8700955

Int. Cl.[5] A23L *1/19*; A23C *1/156*

U.S. Cl. 426—569 **18 Claims**

1. A foamable alcoholic product comprising an emulsified mixture of effective amounts of a calcium source, a fat, protein, an aqueous alcohol composition, and a foam stabilizing agent selected from the group consisting of polyphosphates, lactates and mixtures thereof, whereby the emulsified mixture may be foamed to produce a foamed alcoholic product.

4,943,444

JELLY RESEMBLING THE FLESH OF FRUIT AND PROCESS FOR PRODUCING THE SAME

Hisashi Nozaki, and Seiya Sakurai, both of Saitama, Japan, assignors to Kabushikikaisha Kibun, Tokyo and Kabushikikaisha Kyowashokuhin, Saitama, both of, Japan

Filed Dec. 21, 1988, Ser. No. 287,868

Claims priority, application Japan, Dec. 22, 1987, 62-322808

Int. Cl.[5] A23L *1/072*

U.S. Cl. 426—573 **15 Claims**

1. A jelly having tissues having a mouth-feel that resembles that of a peach, which is produced by the steps of:

(a) mixing water, konjak flour and a basic amino acid, or a basic salt, or a mixture thereof to prepare a konjak paste;

(b) heating the konjak paste under alkaline conditions;

(c) cooling the heated paste quickly prior to setting to a gel to prepare a konjak jelly;

(d) adding the juice of fruit to the konjak jelly and stirring the ingredients to form a mixture;

(e) freezing the mixture; and

(f) thawing the frozen mixture.

4,943,445

EDIBLE DISPERSION

Ian T. Norton, Rushden, and Charles R. T. Brown, Bedford, both of Great Britain, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 20, 1987, Ser. No. 123,438

Claims priority, application United Kingdom, Nov. 24, 1986, 8628069

Int. Cl.[5] A23D *3/00*

U.S. Cl. 426—573 **14 Claims**

1. Edible dispersion which comprises 15–90 wt.% of a dispersed aqueous phase and 10–85 wt.% of a continuous fat phase, the composition constituting the aqueous phase being a gel-forming composition comprising carrageenan and containing a cation (A) selected from the group consisting of potassium, calcium, magnesium and mixtures thereof in a concentration effective to cause the gel-forming composition to have a transition midpoint temperature in the range of 10°–45° C., the carrageenan being selected from the group consisting of kappa-carrageenan, iota-carrageenan and a mixture thereof, said carrageenan present in the amount of 0.1–10 parts per 100 parts by weight of any water included within said dispersion, said gel-forming composition capable of forming a gel having a yield stress of at least 0.5 kN/m^2 at 5° C.

4,943,446

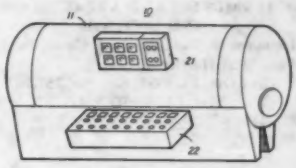
METALLIZATION OF SUBSTRATES

Harold Isherwood, Llangattock Powys, and Roy A. H. Iles, Crickhowell Powys, both of United Kingdom, assignors to Denaison Manufacturing Company, Framingham, Mass.

Filed Sep. 11, 1984, Ser. No. 649,385

Int. Cl.[5] B05D *3/12*

U.S. Cl. 427—9 **2 Claims**



1. The method of metallizing a longitudinally extending substrate which comprises the steps of:

(a) applying a metallic film to said substrate; and

(b) measuring said film thickness by inducing an eddy current in the film which is detected and used to provide an indication of said film thickness.

4,943,447

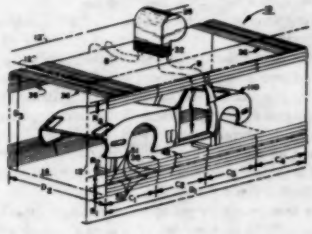
AUTOMOTIVE COATING TREATING PROCESS

James S. Nelson, Moundsview; Scott L. Angell, New Hope; Jack E. Mannerud, Plymouth, and Charles H. Bergman, Jr., New Brighton, all of Minn., assignors to BGK Finishing Systems, Inc., Blaine, Minn.

Division of Ser. No. 151,912, Feb. 3, 1988, Pat. No. 4,908,231, which is a division of Ser. No. 905,289, Sep. 19, 1986, Pat. No. 4,771,728. This application Sep. 6, 1989, Ser. No. 403,654

Int. Cl.[5] B05D *3/06, 1/36, 3/02*; F26B *3/28*

U.S. Cl. 427—55 **7 Claims**



1. A process for finishing an automobile body with an E-coat, a base coat and a clear coat with apparatus having radiant heating means for generating infrared radiation and convection heating means for generating a flow of heated air, said radiant heating means including a plurality of zones with an intensity of at least a given zone separately controllable from an intensity of other zones,

(a) applying an E-coat to said automotive body;

(b) setting said E-coat with said infrared radiation while separately controlling at least said given zone in response to a predetermined characteristic of said body within said given zone;

(c) curing said E-coat with said heated air;

(d) applying a base coat to said automotive body;

(e) setting said base coat with said infrared radiation while separately controlling said given zone in response to a

predetermined characteristic of said body within said given zone;

(f) drying said base coat with said heated air;

(g) applying a clear coat to said automotive body;

(h) setting said clear coat with said infrared radiation while separately controlling said given zone in response to a predetermined characteristic of said body within said given zone;

(i) curing said clear coat with said heated air.

4,943,448

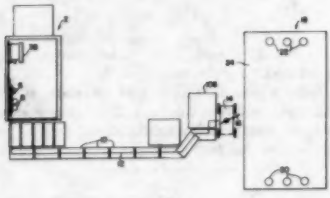
COATING APPLICATION SYSTEM FOR HIGH VOLTAGE TERMINALS AND AREAS THEREAROUND AND METHOD

Robert C. Lacourciere, West Hartford, Conn., assignor to Leak-sealers, Inc., West Hartford, Conn.

Filed Oct. 14, 1988, Ser. No. 257,767

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—58 **22 Claims**



14. A method of selectively applying a coating material to surfaces situated adjacent to or on live, high voltage electric bus work and terminals, said method comprising;

providing a liquified coating material formed of a dielectric material having a polyester base mixed with an organic solvent;

storing said coating material within container means;

electrically isolating said container means having said coating material stored therein from potential ground source by providing a dielectric barrier;

providing applicator means and forming said applicator means from a dielectric material;

supporting said applicator means for movement relative to said surfaces;

providing pump means and electrically isolating it by supporting said pump means on a dielectric barrier;

providing conduit means formed from a dielectric material;

connecting said pump means with said applicator means using said conduit means;

providing an electrically nonconductive fluid drive source;

driving said pump means with said electrically nonconductive fluid drive source;

utilizing said pump means to transport said liquified coating material from said container means through said conduit means to said applicator means; and

applying said coating material to said surfaces using said applicator means.

4,943,449

MICROCAPSULES AND PROCESS FOR PRODUCING THEM

Shizuo Aishima; Yoshito Takahashi; Masaki Kosemura, and Masaaki Okkawara, all of Yokohama, Japan, assignors to Okkawara Kakohki Co., Ltd., Kanagawa, Japan

Filed Sep. 1, 1987, Ser. No. 91,793

Claims priority, application Japan, Dec. 15, 1986, 61-298366

Int. Cl.[5] B01J *13/02*

U.S. Cl. 427—213.3 **5 Claims**

1. A process for producing microcapsules which comprises dissolving wax or a mixture of wax and protein in a mixed solvent consisting of 65 to 90% by volume of an organic solvent miscible with water, and water,

wetting, with the resulting solution, the surfaces of particles of a core substance at a temperature of 45° C. or below to selectively deposit the wax or the mixture of wax and protein on the surfaces of said particles and coat the surfaces of the particles by forming a slurry of the particles of the core substance in said solution; and

then subjecting the slurry containing the particles to a solvent removal treatment.

4,943,450

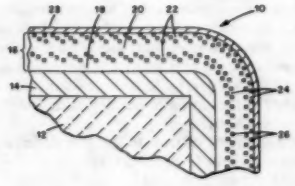
METHOD FOR DEPOSITING NITRIDE-BASED COMPOSITE COATINGS BY CVD

Vinod K. Sarin, Lexington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 206,399, Jun. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 5,003, Jun. 14, 1988, Pat. No. 4,751,109. This application Dec. 14, 1989, Ser. No. 453,235

Int. Cl.[5] C23C *16/34, 16/36*

U.S. Cl. 427—255.2 **11 Claims**



1. In a process for depositing a wear resistant refractory layer on a hard refractory substrate comprising the step of:

passing over the substrate a first gaseous mixture comprising a first halide vapor selected from the group consisting of halides of Si, B, Al, Y, Ti, Zr, Hf, V Nb, Ta, Mo and W, and one or more volatile nitriding gases, at a temperature between about 800° C. and a temperature detrimental to the service substrate properties, at a pressure between about 0.75 torr and about ambient pressure, and at partial pressure ratios, at a flow rate, and for a time sufficient to deposit a continuous, fully dense, adherent, wear resistant layer comprising at least one refractory, first phase nitride of Si, B, Al, Y, Ti, Zr, Hf, V, Nb, Ta, Mo, or W about 0.1–20microns thick on the substrate;

the improvement which comprises the step of:

mixing with the first gaseous mixture at least one additional vapor selected from the halides of Si B, Al, Y, Ti, Zr, Hf, V, Nb, Ta, Mo, and W to form a second gaseous mixture;

wherein the additional vapor is different from the first halide vapor, and is mixed at a partial pressure selected to form at least one discontinuous additional phase, dispersed as discrete particles within the continuous nitride layer, and comprising at least one refractory nitride of Si B, Al, Y,

Ti, Zr, Hf, V, Nb, Ta, Mo, or W to form a fully dense, adherent, wear resistant, composite refractory layer on the substrate.

4,943,451

PROCESS AND DEVICE FOR APPLYING A FLOWABLE SUBSTANCE TO A SURFACE

Johannes Zimmer, Ebentaler Strasse 133, A-9020 Klagenfurt, Austria

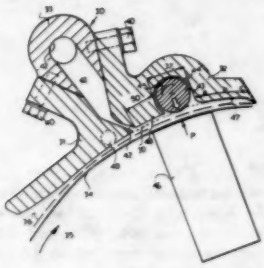
PCT No. PCT/AT86/00040, § 371 Date Feb. 26, 1987, § 102(e) Date Feb. 26, 1987, PCT Pub. No. WO86/06656, PCT Pub. Date Nov. 20, 1986

PCT Filed May 6, 1986, Ser. No. 10,084

Claims priority, application Austria, May 8, 1985, 1390/85

Int. Cl.[5] B05D *3/12, 3/00;* B05C *3/18*

U.S. Cl. 427—294 **17 Claims**



1. A process for applying a flowable substance to a surface, comprising the steps of:

(a) displacing a surface to which a flowable substance is to be applied in a predetermined direction;

(b) juxtaposing said surface with an applicator having a slot opening toward said surface, and a broad face confronting said surface and extending generally along said surface from an edge of said slot in said direction to a trailing end portion of said applicator;

(c) floatingly supporting said applicator relative to said surface so that hydrostatic pressure on said broad face tends to urge said applicator away from said surface, while biasing said applicator toward said surface, said surface and said broad face being so shaped that said trailing end portion can move toward said surface; and

(d) forcibly feeding said flowable substance through said slot onto said surface so that the amount of said substance applied to said surface is controlled only by the rate at which the substance is forced through said slot and the hydrostatic pressure of said substance between said face and said surface is sufficient to hold said applicator out of contact with said surface except for said trailing end portion which is supported by said surface.

9. An apparatus for applying a flowable substance to a surface, comprising:

means for displacing a surface to which a flowable substance is to be applied in a predetermined direction;

an applicator juxtaposed with said surface and formed with a slot opening toward said surface, and a broad face confronting said surface and extending generally along said surface from an edge of said slot in said direction to a trailing end portion of said applicator;

means for floatingly supporting said applicator relative to said surface so that hydrostatic pressure on said broad face tends to urge said applicator away from said surface, while biasing said applicator toward said surface; and

means for forcibly feeding said flowable substance through said slot onto said surface so that the amount of said substance applied to said surface is controlled only by the rate at which the substance is forced through said slot and the hydrostatic pressure of said substance between said face and said surface is sufficient to hold said applicator out of contact with said surface except for said trailing end portion which is supported by said surface, said means for floatingly supporting said applicator relative to said surface being so constructed and arranged that said applicator is biased by its own weight against said surface.

4,943,452

METHOD FOR IMPROVING COMPOSITE MATERIALS BY USE OF A SILANE COUPLING AGENT

Akinari Itagaki; Masaaki Yamaya, both of Gunma; Hiroshi Yoshioka, Tokyo; Akihiko Watanabe, and Keita Miyazato, both of Fukushima, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo and Nitto Roseki Co., Ltd., Fukushima, both of, Japan

Filed Aug. 15, 1988, Ser. No. 232,038

Claims priority, application Japan, Aug. 18, 1987, 62-204925

Int. Cl.[5] B05D *3/00, 1/36, 7/00*

U.S. Cl. 427—299 **11 Claims**

1. In a method for the preparatin of a composite material composed of an inorganic reinforcing material and a synthethic resin as the matrix, the improvement which comprises the steps of: prior to compounding of the inorganic reinforcing material and the synthetic resin, treating the inorganic reinforcing material with a treating agent comprising: (a) a solvent; and (b) a trialkoxysilyalkyl-substituted polymethylene diamine compound represented by the general formula

$$(R^1O)_3SiR^2NH(CH_2)_nNHCH_2C_6H_5$$

in which R^1 is a methyl group or an ethyl group, R^2 is a divalent hydrocarbon group having 1 to 6 carbon atoms and n is an integer in the range of 4 to 8, or a hydrochloride thereof, dissolved in the solvent, followed by drying, to deposit the trialkoxysilyalkyl-substituted polymethylene diamine compound or a hydrochloride thereof on the surface of the inorganic reinforcing material.

4,943,453

METHOD AND COLORATION OF PARTS TAKEN AMONG PARTS MADE OF ZINC, COATED WITH ZINC AND MADE OF ZINC CONTAINING ALLOY

Yves Baziard, Toulouse; Robert Brun, Bordeaux, and Annette P. Duprat, Dax, all of France, assignors to Societe Civile de Recherche D.B.B., Landes, France

Filed May 25, 1988, Ser. No. 198,241

Claims priority, application France, May 25, 1987, 87 07346

Int. Cl.[5] B05D *3/04*

U.S. Cl. 427—309 **10 Claims**

1. A method for coloration of parts taken among parts made of zinc, coated with zinc and made of zinc containing alloy, comprising the steps of subjecting each of said parts to action of an acid aqueous solution containing halogen ions, nitric acid and acetic acid for causing surface of the part to be porous over a layer of a thickness of zinc of the part, flushing the part, and causing the part to absorb at least one sealing material.

4,943,454

EXPANDABLE COLLAPSIBLE PRODUCT AND METHOD AND APPARATUS FOR ITS MANUFACTURE

Craig A. Neff, Golden, Colo., assignor to Hunter Douglas, Inc.

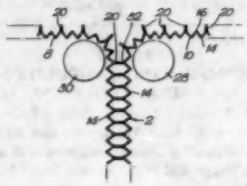
Continuation-in-part of Ser. No. 90,766, Aug. 28, 1987, Pat. No. 4,861,404. This application Aug. 5, 1988, Ser. No. 229,381

Int. Cl.[5] B32B *3/12*

U.S. Cl. 428—12 **5 Claims**

1. An expandable, collapsible product made by a method comprising the steps of folding a first and a second sheet of flexible material to provide a plurality of first transverse folds therein, said first folds projecting to one side of the first sheet and to one side of said second sheet respectively, folding the

first sheet and the second sheet to provide a plurality of second folds therein, each of said second folds projecting to the other side of said first sheet and said second sheet respectively between two of said first transverse folds, modifying at least certain of the second folds of the first sheet by securing parts of



said folded material together to form first legs, positioning said first and second sheets, so that the other side of said first sheet faces the other side of said second sheet, and combining said first and second sheets so that said first legs are each secured to a separate fold of said second sheet.

4,943,455

ARTIFICIAL FLOWER CONSTRUCTION

Paula D. Dixon, 1139 4th Ave., Los Angeles, Calif. 90019

Filed Feb. 27, 1989, Ser. No. 315,479

Int. Cl.[5] A41G *1/00*

U.S. Cl. 428—26 **1 Claim**

1. An artificial flower construction comprising:

an elongated, flexible semi-rigid support having opposite ends;

a bulbous form of teardrop-shape secured to one end of said support;

a plurality of shaped components attached to said bulbous form in a cluster outwardly extending from said one end of said support in substantially coaxial relationship therewith and with each other;

said components composed of an elastic material characterized as having normally constricting bias along edge marginal regions thereof cooperating to shape each component in a predetermined configuration;

said component composition is cured rubber latex;

a strip of material carried about said support along its length in a wound and wrapped mounting between said opposite ends;

decorative elements adhesively attached in a predetermined pattern on the exterior exposed surface of each of said components; and

each of said components is a representation of a portion of a flower bloom and collectively representing a full and complete flower bloom.

4,943,456

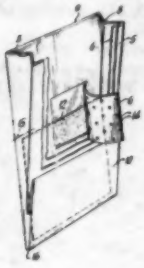
MICROWAVE REACTIVE HEATER

Kenneth A. Pollart, and Terrence P. Lafferty, both of Neenah, Wis., assignors to James River Corporation of Virginia, Richmond, Va.

Continuation-in-part of Ser. No. 239,544, Sep. 1, 1988. This application Aug. 30, 1989, Ser. No. 400,579

Int. Cl.[5] H05B *6/64*; B65D *81/34*

U.S. Cl. 428—34.3 **6 Claims**



1. In an article having a microwave reactive heater comprising a heat stable substrate with a microwave interactive surface coating thereon comprising finely divided carbon, a finely divided microwave reactive metal, clay, and a dielectric organic solid binder, the improvement which comprises laminating with an adhesive the microwave heater surface to a surface of the article to be heated.

4,943,457

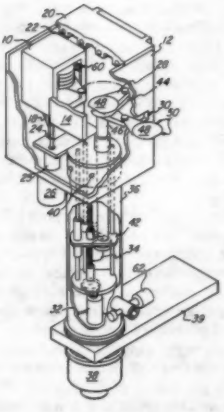
VACUUM SLICE CARRIER

Cecil J. Davis, Greenville, and Robert Matthews, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 60,991, Jun. 12, 1987, abandoned, which is a continuation of Ser. No. 790,918, Oct. 24, 1985, abandoned. This application Sep. 4, 1987, Ser. No. 96,216

Int. Cl.[5] B32B *3/00*; B65D *17/42*

U.S. Cl. 428—35.2 **7 Claims**



1. In an apparatus for storage and transport of wafers;

an evacuable and transportable housing for containing an array of wafers;

said housing having an access port therein for accessing the wafers contained within said housing;

closure means for closing and sealing said access port in said housing; and

means for producing a pressure differential between the pressure of the surrounds of said housing relative to the subatmospheric pressure contained within said housing to cause said closure means to be urged into gaseous sealing engagement with the evacuated housing by atmospheric pressure, whereby the wafers are contained in an evacuated transportable housing means for transport and storage at atmospheric pressure.

4,943,458

HOLLOW PLASTIC BODY HAVING A GLOSSY SURFACE

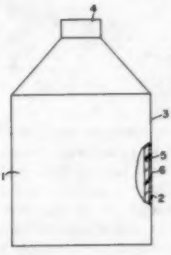
Herbert Baecheler, Erkrath, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 21, 1988, Ser. No. 287,965

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1987, 3744639

Int. Cl.[5] B65D *23/00*; B32B *27/32*

U.S. Cl. 428—35.7 **7 Claims**



1. A two layer hollow plastic body, having a glossy unpigmented polyethylene outer surface layer, formed from a two-layer parison by a blow molding process, wherein the two layer hollow plastic body consists essentially of a high-density polyethylene inner layer (5) and an unpigmented low density polyethylene outer layer (6) containing additives.

4,943,459

HEAT-RESISTANT COMPOSITE SHEET AND CONTAINER FORMED OF THE SAME

Shigeru Nedzu, Shizuoka, Japan, assignor to Polyplastics Co., Ltd., Osaka, Japan

Filed Jun. 7, 1989, Ser. No. 363,481

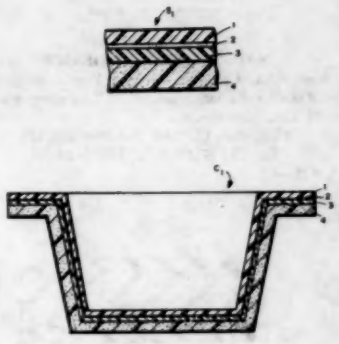
Claims priority, application Japan, Jun. 29, 1988, 63-161458

Int. Cl.[5] B32B *3/26*

U.S. Cl. 428—36.5 **4 Claims**

1. A heat-resistant composite sheet composed, as the main constituents, either of a foamed polystyrene sheet and a polybutylene terephthalate resin film, or of a foamed polystyrene sheet, a polystyrene resin film and a polybutylene terephthalate resin film, wherein the polybutylene terephthalate resin film layer is laminated to form both or one of the outer layers.

3. A heat-resistant container made of a heat-resistant composite sheet as set forth in claim 1 or 2, wherein the composite sheet is arranged so that the polybutylene terephthalate resin



film layer of the composite sheet is located on the inner side of the container.

4,943,460

PROCESS FOR COATING POLYMER SURFACES AND COATED PRODUCTS PRODUCED USING SUCH PROCESS

Richard A. Markle; Phyllis L. Brusky, both of Columbus, and John H. Baker, Strasburg, all of Ohio, assignors to Snyder Laboratories, Inc., Dover, Ohio

Continuation-in-part of Ser. No. 157,856, Feb. 19, 1988, abandoned. This application Feb. 13, 1989, Ser. No. 308,679

Int. Cl.[5] B29D *22/00*

U.S. Cl. 428—36.9 **16 Claims**

1. A process for treating a medical article or device having a polymeric surface to produce a smooth, durable, slippery coating comprising:

applying to the polymeric surface of the said article or device a primer coat;

applying to said surface a tie coat comprising a solution selected from aqueous solutions of polyacrylic acid, dimethyl formamide solutions of poly(methyl vinyl ether/-maleic anhydride), 1:1 methanol/isopropanol solutions of poly(methyl vinyl ether/maleic anhydride) and solutions of poly(methyl vinyl ether/maleic anhydride) in one or more alcohols selected from the group comprising the lower alcohols of methanol through pentanol or mixtures thereof in water; and

applying to said surface a slippery coating comprising a solution of polyvinylpyrrolidone.

4,943,461

RADIATION-CURABLE PRESSURE-SENSITIVE ADHESIVE HAVING IMPROVED ADHESION TO PLASTICIZED VINYL SUBSTRATES

Naimul Karim, Dormagen, Fed. Rep. of Germany, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 1, 1989, Ser. No. 305,202

Int. Cl.[5] C09J *109/02*, *133/08*

U.S. Cl. 428—40 **14 Claims**

1. A photopolymerized pressure-sensitive adhesive having outstanding ability to bond to plasticized vinyl substrates and to remain firmly bonded thereto even after remaining in contact therewith for extended periods of time, comprising:

(a) a copolymer of monomers consisting essentially of from about 60 to about 85 parts of acrylic acid ester of nonterti-

ary alcohol, the alkyl groups of which contain from about 4–14 carbon atoms, and from about 15 to about 40 parts of a polar nitrogen-containing vinyl monomer, and

(b) 1–10 parts of an acrylonitrile butadiene rubber, based on the weight of the copolymer.

4,943,462

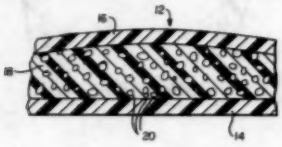
NAIL TREATMENT DEVICE

James Komerska, Chalfont; George Petito, Bethlehem, and Borys Rybalka, Philadelphia, all of Pa., assignors to Semex Medical, Inc., Malvern, Pa.

Filed Jan. 17, 1989, Ser. No. 297,576

Int. Cl.[5] B32B *9/02, 27/04, 27/08*

U.S. Cl. 428—42 **12 Claims**



1. A device for application to the surface of a fingernail or toenail, comprising:

a substrate sheet having an inner surface thereto;

an aqueous phospholipid composition affixed adjacent said inner surface of said substrate sheet; and

an adhesive layer comprising a pressure-sensitive adhesive layer affixed adjacent said inner surface of said substrate sheet; wherein said aqueous phospholipid composition is dispersed within said adhesive layer.

4,943,463

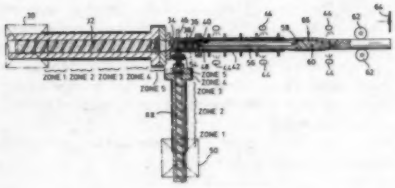
LARGE DIMENSIONAL THERMOPLASTIC ARTICLES

John T. Back, Vasa, Finland, assignor to Oy Wiik & Hoglund AB, Vasa, Finland

Division of Ser. No. 670,012, Nov. 9, 1984, Pat. No. 4,704,244. This application Aug. 21, 1987, Ser. No. 87,758

Int. Cl.[5] B29C *47/90*

U.S. Cl. 428—44 **3 Claims**



1. A rigid article composed of solid, non-foamed, thermoplastic material and having a uniform, non-hollow, continuous, void-free cross-section of predetermined dimensions of 50 millimeters to 300 millimeters produced by the steps of a continuous extrusion method;

said article having an intermediate configuration of a solid but flexible portion expanded larger than the predetermined cross-sectional dimension produced by the intermediate extrusion steps of extruding a first stream of molten thermoplastic material through a die to form a hollow profile; shaping and cooling said profile by a calibration jacket downstream from said die sufficiently to solidify the thermoplastic material; and feeding a second stream of molten thermoplastic material through a conduit extending along the hollow of said profile formed by said first stream and injecting said second stream into said hollow at a point down stream from said die, adjacent the downstream end of said calibration jacket, while exerting sufficient pressure on said second stream to force said thermoplastic material of said second stream into any void spaces in said hollow profile, and further to cause said hollow profile to expand larger than the predetermined dimension upon emerging from the downstream end of said calibration jacket;

and said article having a final configuration conforming to the predetermined dimension after said extruded hollow profile is allowed to return to the predetermined dimension of the calibration jacket when said second stream shrinks upon cooling.

4,943,464

ELECTRONIC COMPONENT SUPPORT FOR MEMORY CARD AND PRODUCT OBTAINED THEREBY

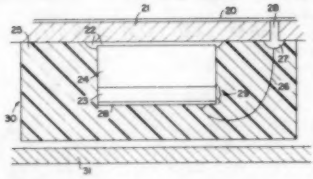
Jean-Pierre Gloton, Aix en Provence, and Philippe Peres, Gardanne, both of France, assignors to SGS-Thomson Microelectronics SA, Gentilly, France

Filed Dec. 1, 1988, Ser. No. 278,979

Claims priority, application France, Dec. 14, 1987, 87 17385

Int. Cl.[5] B32B *3/02*

U.S. Cl. 428—76 **9 Claims**



1. An electronic component support for a memory card which has a cavity to house said component, said support comprising a first silicon base of 50 to 100 microns thickness, one side of which is used as the substrate for the manufacture of the different elements of the electronic component, and comprising a second base of 100 to 300 microns thickness made of a harder material than silicon, and selecting from the group consisting of titanium, cobalt, vanadium, ceramic, and fiberglass-charged plastic, which is fixed to the other side of the first base, the second base being fixed to a film which acts as an element to close the cavity.

4,943,465

THERMAL INSULATING, HIGH TEMPERATURE RESISTANT COMPOSITE

Douglas J. Bailey, Snyder; Paul Boymel, Kenmore, and Juan M. Cerdan, Tonawanda, all of N.Y., assignors to The Carborundum Company, Cleveland, Ohio

Filed Oct. 24, 1988, Ser. No. 261,944

Int. Cl.[5] B32B *3/06, 31/20*

U.S. Cl. 428—102 **22 Claims**

1. A thermal insulation composite having improved structural integrity and suitable for use in high temperature environments, comprising:

(1) randomly laid and oriented heat resistant fibers having an average diameter of about 0.1 to 1.75 micron interlocked together into the form of a shape sustaining paper having two lateral surfaces, said paper having a thickness of from about 0.1 to 1.0 inch, a fiber index of more than 85%, and a density of about 5 pounds per cubic foot to about 15 pounds per cubic foot, said paper being compressed from about 20% to about 500% from its original thickness to make a paper having a density of about 6 to 30 pounds per cubic foot.

(2) a high temperature resistant, flexible, woven or non-woven scrim having a weight of from 0.5 to 10 oz./yd^2

disposed upon each of the lateral surfaces of the said paper; and

(3) a network of abrasion-resistant, high temperature-resistant threads stitched through said scrim and said paper in the form of stitching lines of a repeating pattern such that said scrim is mechanically locked to said paper by said threads;

whereby, the said network of threads and said scrim substantially retain the structural integrity of the said paper to maintain said paper in compression.

4,943,466

PLASTIC MOLDING

Gerry Bareich, Tecumseh, Canada, assignor to Automotive Moulding Company, Warren, Mich.

Filed Oct. 7, 1986, Ser. No. 916,359

Int. Cl.[5] E06B *7/16*

U.S. Cl. 428—122 **2 Claims**

1. In a vehicle, a window assembly comprising:

a glass member being a vehicle window movable between upper and lower positions;

a weather strip which provides a sliding contact surface for said glass member, said weather strip comprising a metal portion and a plastic portion bonded to said metal portion, said weather strip having a first face facing towards said glass member and a second face facing away from said glass member, said plastic portion including a thermoplastic material; and

coating means bonded to said first face of said plastic portion for providing sliding contact with said glass member;

said second face having a portion of bare metal.

4,943,467

PRINTING PLATES FOR CORRUGATED BOARD

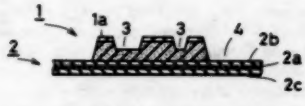
Inoue Shuji, Tsu, Japan, assignor to Kureha Rubber Industry Co., Ltd., Osaka, Japan

Filed Dec. 23, 1988, Ser. No. 288,904

Claims priority, application Japan, Dec. 24, 1987, 62-1927238[U]; Apr. 11, 1988, 63-48700[U]

Int. Cl.[5] B41N *1/00*; B32B *3/30*

U.S. Cl. 428—159 **18 Claims**



7. A printing plate for corrugated paper board comprising:

a foam sheet having a skin layer with a thickness in the range of about 0.3 to 2 mm, the skin layer providing a printing surface of a selected smoothness and a SRIS(c) hardness in the range of about 35 to 55; the foam sheet further having a foam layer of a selected thickness greater than that of the skin layer;

a base cloth underlying the foam sheet and having a first surface facing the foam sheet and a second surface facing away from the foam sheet;

rubber cladding means comprising a rubber cladding disposed between the base cloth and foam sheet and being adhered to the foam sheet and adhesively secured with respect to the base cloth;

relatively shallow recesses sculpted into the foam sheet, the relatively shallow recesses having a depth at least as deep as the thickness of the surface skin layer of the foam sheet but not as deep as the thickness of the foam; and

relatively deep recesses having a depth at least as deep as the thickness of the foam layer and surface skin layer combined and extending no deeper than the base cloth,

wherein the relatively deep and relatively shallow recesses form a printing plate with surface relief having printing surfaces defined by those portions of the surface skin layer not deleted by the relatively shallow and relatively deep recesses.

4,943,468

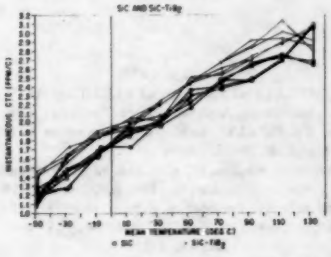
CERAMIC BASED SUBSTRATE FOR ELECTRONIC CIRCUIT SYSTEM MODULES

Robert J. Gordon, Coppell; Brian J. Love, Dallas; Robert K. Peterson, Garland, and Burhan Ozmat, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 31, 1988, Ser. No. 265,120

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—210 **23 Claims**



1. An electronic system comprising:

(a) a first printed wiring board;

(b) a first integrated circuit carrier disposed on and secured to said printed wiring board; and

(c) a substrate having a central portion formed of ceramic material, said central portion having a specific thermal conductivity greater than 15×10^{-6} $Wm^2/g^{\circ}C.$, said substrate including a fist surface, said printed wiring board being secured to and coplanar with said first surface.

4,943,469

CERAMIC, CIRCUIT SUBSTRATE AND ELECTRONIC CIRCUIT SUBSTRATE BY USE THEREOF AND PROCESS FOR PRODUCING CERAMIC

Motoo Kumagai, Yokohama; Keiichi Kato, Tokyo; Masato Nagano, and Michiaki Sakaguchi, both of Iwamizawa, all of Japan, assignors to Canon Kabushiki Kaisha and Nippon Oil & Fats Co. Ltd., both of Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 216,233

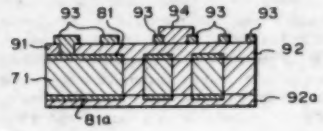
Claims priority, application Japan, Jul. 9, 1987, 62-172012

Int. Cl.[5] B32B *3/00*

U.S. Cl. 428—209 **6 Claims**

1. A ceramic comprising therein at least two dielectric regions including (a) a first region having (i) a principal composition consisting of from 49.50–54.00 mole percent of TiO_2 and from 50.50–46.00 mole percent of SrO, (ii) from 0.50–5.30 moles MnO_2 per 100 moles of the principal composition and (iii) from 0.02–0.40 moles Y_2O_3 per 100 moles of said principal composition; and (b) a second region having (i) a principal

composition consisting of from 49.50–54.00 mole percent of TiO_2 and from 50.50–46.00 mole percent oif SrO; (ii) from 0.50–5.30 moles MnO_2 per 100 moles of the principal composition; (iii) from 0.02–0.40 moles Y_2O_3 per 100 moles of the principal composition; (iv) from 0.40–5.00 moles MgO per 100



moles of said principal composition and (v) from 0.05 to 2 moles of SiO_2 per 100 moles of said principal composition.

3. The ceramic according to claim 1 further including at least one oxide selected from the group consisting of iron oxide, cobalt oxide, vanadium oxide, chromium oxide, lead oxide, copper oxide, bismuth oxide and sodium oxide.

4,943,470

CERAMIC SUBSTRATE FOR ELECTRICAL DEVICES

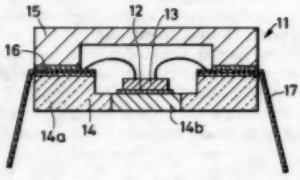
Hisaharu Shiromizu; Asao Morikawa; Tsuneyuki Sukegawa, and Kazuo Kondo, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Continuation of Ser. No. 817,686, Jan. 10, 1986, abandoned. This application Mar. 9, 1989, Ser. No. 320,796

Claims priority, application Japan, Jan. 11, 1985, 60-3759; Jan. 22, 1985, 60-9726; Feb. 26, 1985, 60-37157

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—209 **14 Claims**



1. A multi-layer circuit device comprising:

a green sheet comprised of porous crystalline glass, an insulative portion comprised of a paste of insulating glass thickfilm printed on said green sheet, said paste containing insulating glass consisting essentially of 54 to 63% weight % SiO_2, 20 to 28 weight % Al_2O_3, 10 to 18 weight % MgO, 2 to 6 weight % ZnO, and 0.1 to 6 weight % of an additive component, said additive component being selected from the group consisting of B_2O_3 and P_2O_5, and a conductive portion comprised of an electrically conductive paste thick-film printed on said green sheet, said electrically conductive paste containing a metal selected from the group consisting of Au, Ag, Cu, Pd, Pt, and mixtures thereof, said green sheet and said thick-film printed pastes being subjected to elevated temperatures at which said electroconductive paste is not rendered discontinuous to form said multi-layer circuit device.

4,943,471

PATTERNED THIN FILM AND PROCESS FOR PREPARING THE SAME

Masakazu Uekita; Hiroshi Awaji; Makoto Murata, and Satoshi Mizunuma, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

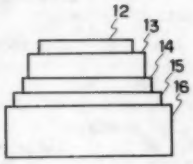
Continuation-in-part of Ser. No. 51,350, May 19, 1987, Pat. No. 4,839,219. This application Sep. 23, 1988, Ser. No. 248,683

Claims priority, application Japan, May 20, 1986, 61-116390; May 20, 1986, 61-116391; Sep. 25, 1987, 62-241640; Apr. 28, 1988, 63-106048

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

Int. Cl.[5] B32B *27/00, 27/34*

U.S. Cl. 428—220 **9 Claims**



1. A patterned, heat resistant thin film consisting essentially of a polymer having linear recurring units wherein an organic group R^1 having at least 2 carbon atoms and a valence of at least 3 is combined alternatively with an organic group R^2 having at least 2 carbon atoms and a valence of at least 2 through two bonding groups at least one of which has a 5-membered or 6-membered ring structure containing a hetero atom.

2. The patterned thin film of claim 1, having a thickness of not more than 1,000 Å and a dielectric strength of not less than 1×10^6 V/cm.

4,943,472

IMPROVED PREIMPREGNATED MATERIAL COMPRISING A PARTICULATE THERMOSETTING RESIN SUITABLE FOR USE IN THE FORMATION OF A SUBSTANTIALLY VOID-FREE FIBER-REINFORCED COMPOSITE ARTICLE

Robert Dyksterhouse; Joel A. Dyksterhouse, both of Marathon, Fla.; Alan C. Handermann, Matthews, N.C., and Edward D. Western, Fort Mill, S.C., assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 157,836, Mar. 3, 1988, Pat. No. 4,919,739, which is a continuation-in-part of Ser. No. 928,917, Nov. 7, 1986, abandoned. This application Oct. 25, 1989, Ser. No. 426,443

Int. Cl.[5] B32B *5/08, 5/26, 27/06, 27.12*

U.S. Cl. 428—240 **23 Claims**

1. An improved preimpregnated fibrous material suitable for the formation of a fiber-reinforced composite article, said preimpregnated fibrous material comprising (a) a plurality of adjoining substantially parallel reinforcing filaments and, substantially uniformly dispersed between adjoining filaments in the absence of fusion bonding, (b) an effective amount of a polymeric water-soluble binding agent, (c) aqueous medium, and (d) solid particles of thermosetting resin, said (b), (c) and (d) having been derived from a dispersion having a viscosity specifically selected to provide a preimpregnated fibrous material which inherently (1) is drapable and tacky at ambient conditions, (2) is handleable without segregation of said particles within the fibrous material and (3) capable upon the application of heat and pressure of being transformed into a substantially void-free composite article of a predetermined configuration wherein said thermosetting resin is substantially completely cured and forms the matrix phase.

4,943,473

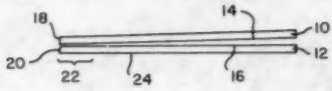
FLEXIBLE LAMINATED FLUOROPOLYMER-CONTAINING COMPOSITES

Ronald A. Sahatjian, Lexington, Mass.; Robert C. Ribbins, III, Amherst, and Mark G. Steckel, Manchester, both of N.H., assignors to Chemical Fabrics Corporation, Merrimack, N.H.

Continuation of Ser. No. 734,977, May 16, 1985, abandoned. This application Oct. 4, 1988, Ser. No. 253,255

Int. Cl.[5] B32B 7/12, 17/10, 27/08

U.S. Cl. 428—245 16 Claims



1. A flexible chemically-resistant protective article having improved barrier properties made from a fluoropolymer laminate composite comprising a flexible fabric substrate and a protective coating lamintaed to at least one side of the said substrate with a melt-bondable fluoropolymer adhesive interlayer, said protective coating having a thickness of less than about 5 mil and comprising a fluoro polymer selected from the group consisting of polytetrafluoroethylene, fluorinated ethylene propylene copolymer, polychlorotrifluoroethylene, copolymers of chlorotrifluoroethylen and tetrafluoroethylene, copolymers of chlorotrifluorethylene and vinylidene fluoride, copolymers of ethylene and tetrafluoroethylene, chlorotrifluoroethylene, perfluoroalkyl vinyl ethers, polyvinylidenefluoride and polyvinylfluoride.

4,943,474

UNSATURATED POLYESTER RESIN COMPOSITIONS AND ELECTRICAL LAMINATES MADE THEREFROM

Hidenari Tsunemi, Otsu; Yasuo Fushiki, Takatsuki; Asaichi Nishimura, and Yousuke Kawai, both of Otsu, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 12, 1989, Ser. No. 296,159

Int. Cl.[5] C08L 67/06

U.S. Cl. 428—246 15 Claims

1. An unsaturated polyester resin composition comprising (a) an unsaturated polyester component which is a mixture of (i) a hard unsaturated polyester and (ii) a soft unsaturated polyester, said soft polyester containing a polyoxyalkylene segment having a molecular height from 600 to 6,000 in the backbone thereof, and said hard polyester being free from said polyoxyalkylene segment, (b) a cross-linking monomer and (c) a polyoxyalkylene alcohol which is a monoalcohol having an average molecular weight from 2,000 to 8,000 and about 40 to 100 mole % of the hydroxy group of which is esterified with a polymerizable unsaturated carboxylic acid.

4,943,475

MULTILAYER COMPOSITE PROTECTIVE FABRIC MATERIAL AND USE IN PROTECTIVE CLOTHING

Richard W. Baker, and Paul Shrock, both of Menlo Park, Calif., assignors to Membrane Technology & Research, Inc., Menlo Park, Calif.

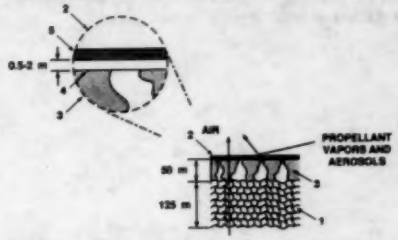
Filed Jul. 23, 1986, Ser. No. 890,378

Int. Cl.[5] B32B 7/00

U.S. Cl. 428—246 22 Claims

1. Protective clothing, comprising at least one garment, said garment being fabricated from a composite material comprising:

a clothing fabric layer, coated with;



a microporous support membrane, coated with;

an ultrathin permselective membrane.

4,943,476

WATER REMOVAL ON PAPERMACHINE THROUGH RIBLET EFFECT

Jerry G. Sokaris, Troy, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Oct. 27, 1988, Ser. No. 263,592

Int. Cl.[5] D04H 1/08

U.S. Cl. 428—280 8 Claims

1. A papermaker's felt for use in the wet press section of a papermachine comprising yarn whose surface is characterized by a plurality of lengthwise grooves.

4,943,477

CONDUCTIVE SHEET HAVING ELECTROMAGNETIC INTERFERENCE SHIELDING FUNCTION

Tomotsugu Kanamura; Toshihiko Shibata, and Yasuji Inoue, all of Aichi, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1988, Ser. No. 249,932

Int. Cl.[5] B32B 27/00

U.S. Cl. 428—286 10 Claims

1. A conductive sheet having an electromagnetic interference shielding function, which consists of a nonwoven fabric consisting of 40 to 90 wt% of a heat fusible fiber comprising a vinyl chloride/vinyl acetate copolymer and 10 to 60 wt% of a metal-plated fiber having a fiber diameter of 3 to 50 μm and an aspect ratio of 1,000 to 10,000, wherein said nonwoven fabric is hot-press molded and wherein said conductive sheet has a metal content of 2 to 30% by weight and a specific volume of at most 2 cm^3/g.

4,943,478

SEAT CUSHIONS

Francis P. McCullough, Jr., Lake Jackson, and R. Vernon Snelgrove, Damon, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 114,324, Oct. 28, 1987, Pat. No. 4,879,168. This application Jun. 14, 1988, Ser. No. 206,636

Int. Cl.[5] B32B 9/00; B27N 9/00; D03D 13/00

U.S. Cl. 428—288 13 Claims

1. A non-woven fire retarding and fire blocking covering for a foam seat cushion structure comprising an intimate blend of a binder and 25–75% by weight of fibers comprising heat set

non-linear, non-graphitic carbonaceous fibers having a LOI value greater than 40, a reversible deflection ratio of greater than 1.2:1, and an aspect ratio greater than 10:1, said carbonaceous fibers being derived from heat treated stabilized polymeric fibers or pitch based fibers.

4,943,479

MAGNETIC RECORDING MEDIUM

Yasuyuki Yamada; Matoko Nagao, and Kazuhiko Morita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 179,803, Apr. 11, 1989, abandoned. This application Nov. 7, 1989, Ser. No. 433,399
Claims priority, application Japan, Apr. 10, 1987, 62-87196
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—331 7 Claims

1. A magnetic recording medium comprising a non-magnetic support and a thin ferromagnetic metal film prepared by vapor deposition or sputtering having provided between said support and said thin ferromagnetic metal film a non-magnetic undercoated layer comprising at least one binder and a dispersion of fine silica particles derived from silica sol having a diameter in the range from about 18 mμ to about 1000 mμ, wherein the silica fine particles are present in said non-magnetic undercoated layer, after drying, in an amount from about 0.01 wt % to about 20 wt %, based upon the total amount of binder in said layer and wherein at least about 45 wt % of the total amount of binder comprises at least one polymerizable (meth)acrylate compound having a triazine ring.

4,943,480

METHOD AND MEDIUM FOR THE COATING OF METALS WITH TIN

David Itzhak, Omer, Israel, assignor to Bromine Compounds Limited, Beer Sheva, Israel

Filed Feb. 24, 1989, Ser. No. 315,439
Claims priority, application Israel, Feb. 25, 1988, 85555
Int. Cl.[5] B32B *9/00, 15/04*
U.S. Cl. 428—332 20 Claims

1. A process for carrying out the coating of metals, comprising contacting the metal to be coated with a coating medium comprising an effective amount of a hot $ZnBr_2/CaBr_2$ heavy brine containing at least about 1 wt % of tin.

18. Coated metals, whenever coated by the process of claim 1.

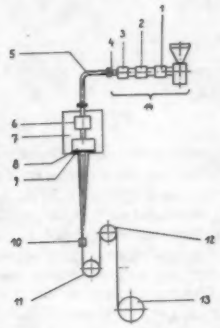
19. Coated metals according to claim 18, having a mean coating thickness of between 0.25 and 1.2 μm.

4,943,481

POLYETHER IMIDE FIBERS

Diederich Schilo, Klingenberg-Rollfeld, and Willi Birkenfeld, Obernburg, both of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed May 23, 1988, Ser. No. 197,389
Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717055
Int. Cl.[5] D02G *3/00*
U.S. Cl. 428—373 3 Claims



1. A melt-spun fiber comprising polyether imide and at least one other melt-spinnable polymer selected from the group consisting of polyethylene terephthalate, polyamide, and mixtures thereof.

4,943,482

METALLIZED PARTICLES OF CROSSLINKED POLYMER, PROCESS FOR THEIR PREPARATION AND THEIR APPLICATION IN THE MANUFACTURE OF ELECTRICALLY CONDUCTIVE MATERIALS

Dominique Charmot, and Jean-Francois Fiard, both of Paris, France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Oct. 4, 1988, Ser. No. 252,924
Claims priority, application France, Oct. 5, 1987, 87 13712
Int. Cl.[5] B32B *15/08, 27/28*
U.S. Cl. 428—407 6 Claims

1. Metallized polymer particles comprising a crosslinked polymer with an insolubles content of at least 0.5% by weight, and bearing nucleophilic groups capable of complexing at least one salt of a metal with an oxidation-reduction potential higher than −0.8 V, and said particles having on their surface a metallic layer comprising at least one metal having an oxidation-reduction potential higher than −0.8 V and said metal being in the zero valency state.

4,943,483

PALLADIUM ALLOY CONTAINING GOLD, SILVER, GALLIUM, GERMANIUM AND/OR LITHIUM AND DENTAL RESTORATIONS UTILIZING SAME

Clyde E. Ingersoll, Tonawanda; Stephen P. Schaffer, Hamburg, and Patrick J. McCabe, Tonawanda, all of N.Y., assignors to Williams Dental Company, Inc., Buffalo, N.Y.

Filed Jan. 25, 1989, Ser. No. 301,139
Int. Cl.[5] B32B *15/04;* C22C *5/04*
U.S. Cl. 428—433 10 Claims

7. A dental restoration comprising:

a. a casting of a dental alloy consisting essentially of

(i) 70–82 percent by weight palladium;

(ii) 5–8 percent by weight gold;

(iii) 6.5–8 percent by weight silver;

(iv) 5–9 percent by weight gallium;

(v) 4–8 percent by weight of a surface oxide producing modifier selected from the group consisting of indium, tin and mixtures thereof;

(vi) from about 0.01 up to about 2 percent by weight of an oxygen scavenging component which is a member selected from the group consisting of germanium, lithium, and mixtures thereof; and

(vii) up to 2 percent by weight of a grain refiner selected from the group consisting of ruthenium, rhenium, iridium, and mixtures thereof;

said alloy having a coefficient of thermal expansion of about $14.0–15\times10^{-6}$in/in/° C., a solidus temperature of at least 1100° C., a liquidus temperature of not more than 1400° C., Vickers hardness greater than 150, offset yield strength at 0.1 percent offset of greater than 40,000 p.s.i., and tensile elongation greater than 6 percent; and

b. a porcelain coating upon a portion of said casting, said coating being firmly bonded to said casting and being substantially free from discoloration.

4,943,484

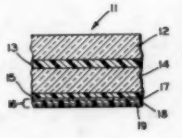
SOLAR CONTROL GLASS ASSEMBLY AND METHOD OF MAKING SAME

Ronald D. Goodman, Toledo, Ohio, assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Continuation of Ser. No. 898,098, Aug. 20, 1986, abandoned. This application Jul. 25, 1988, Ser. No. 223,681

Int. Cl.[5] B32B *17/06*

U.S. Cl. 428—441 **7 Claims**



1. A solar control glass assembly, comprising:

A) a glass substrate having a surface:

B) a first attaching layer adhered to the surface of the glass substrate, comprising a carrier layer of a plastic material coated on a first surface thereof with a pressure sensitive adhesive and on a second surface thereof with a water activated adhesive;

C) an induced transmission filter adhered to the attaching layer, comprising a first layer of a dielectric material, a second layer of a reflective material, third and fourth layers of a dielectric material, a fifth layer of a reflective material, and a sixth layer of a dielectric material;

D) a layer of polyester adhered to the induced transmission filter; and

E) a layer of an abrasion resistant material adhered to the layer of polyester.

4,943,485

PROCESS FOR APPLYING HARD COATINGS AND THE LIKE TO METALS AND RESULTING PRODUCT

Ibrahim M. Allam, Dhahran, Saudi Arabia, and David J. Rowcliffe, Stockholm, Sweden, assignors to S R I International, Menlo Park, Calif.

Division of Ser. No. 111,202, Oct. 21, 1987, Pat. No. 4,857,116, which is a continuation-in-part of Ser. No. 325,504, Nov. 27, 1981, Pat. No. 4,483,720, and a continuation-in-part of Ser. No. 662,253, Oct. 17, 1984, abandoned, and a continuation-in-part of Ser. No. 662,252, Oct. 17, 1984, abandoned. This application Jul. 18, 1989, Ser. No. 381,508

Int. Cl.[5] B32B *15/04*

U.S. Cl. 428—457 **16 Claims**

1. A coated metal substrate comprising:

(a) a metal substrate and

(b) a coating on and adherent to at least one surface of the substrate, such coating being an alloy of M_1 and M_2 wherein M_1 is zirconium or titanium and M_2 is a more noble metal than M_1 and which forms a less thermodynamically stable compound than M_1 with the elements N, C, B and Si or forms no such compound, the metal M_1 being present in an amount not less than 50% by weight, M_2 being present in substantial amount not exceeding 50% by weight and sufficient to act as a binder for the nitride, carbide, boride or silicide of M_1 to the substrate

such coating being of a uniform, non-porous character such that, upon selective reaction of the coating with a reactive molecular species of such element to form such a compound of zirconium or titanium with N, C, B or Si, the resulting coating is uniform, dense and substantially free of porosity.

4,943,486

COATED ARTICLE AND METHOD OF PRODUCTION

Akira Uchiyama, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Mar. 31, 1988, Ser. No. 176,124

Claims priority, application Japan, Apr. 1, 1987, 62-80615; Apr. 1, 1987, 62-80617

Int. Cl.[5] B23K *26/00*; C23C *14/06, 16/34*; G04B *37/22*

U.S. Cl. 428—469 **21 Claims**

1. A coated article having a hard outer coating film on a substrate, comprising:

a metallic chromium layer disposed on the substrate; and

an outer layer of chromium nitride carbide on the metallic chromium layer to form the hard coating film.

4,943,487

CORROSION RESISTANT COATING FOR OXIDE DISPERSION STRENGTHENED ALLOYS

Raymond C. Benn; Gaylord D. Smith, both of Huntington, W. Va., and Donald H. Boone, Walnut Creek, Calif., assignors to INCO Alloys International, Inc., Huntington, W. Va.

Filed Jul. 18, 1988, Ser. No. 220,836

Int. Cl.[5] B22F *3/26*

U.S. Cl. 418—552 **20 Claims**

1. A high temperature, corrosion resistant article of manufacture, the article comprising a mechanically alloyed oxide

dispersion strengthened metal alloy substrate, a duplex coating on the substrate, the duplex coating including an inner coating substantially free of oxide dispersoids disposed on the substrate, and a corrosion resistant outer coating disposed on the inner coating, the outer coating of the MCrAlY type, wherein M is selected from the group consisting of nickel, cobalt, iron, and mixtures thereof.

4,943,488

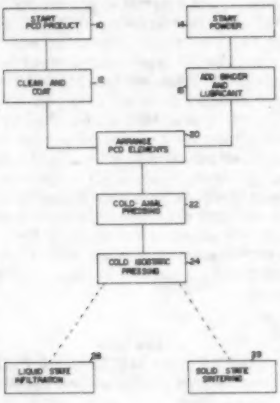
LOW PRESSURE BONDING OF PCD BODIES AND METHOD FOR DRILL BITS AND THE LIKE

Chien-Min Sung, Northboro, Mass.; Sy-Hwa Chen, Salt Lake City, Utah; Leo Merrill, Orem, Utah, and Louis K. Bigelow, Salt Lake City, Utah, assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 95,054, Sep. 15, 1987, abandoned, and a continuation-in-part of Ser. No. 61,705, Jun. 11, 1987, abandoned, said Ser. No. 95,054, is a continuation-in-part of Ser. No. 921,364, Oct. 20, 1986, abandoned. This application Nov. 18, 1988, Ser. No. 273,405

Int. Cl.[5] B22F 7/02

U.S. Cl. 428—552 **50 Claims**



1. An earth boring bit, comprising:

a matrix bit body,

at least one cutter element bonded to said matrix bit body,

said cutter element comprising at least one polycrystalline diamond element which is temperature stable to about 1,200° C. and a matrix carrier which is chemically bonded thereto,

said temperature stable diamond element having a carbide forming metal coating at least 5 microns thick on the surface thereof in contact with said matrix carrier, said metal being chosen from the group consisting of tungsten, tantalum, and molybdenum,

said metal coating comprising a carbide layer adjacent to said diamond element and a substantially metallic outer portion adjacent to said matrix carrier,

said diamond element being chemically bonded to said metal coating by means of said carbide layer, and said metallic outer portion being chemically bonded to said matrix carrier, said carbide layer bonding said diamond element to said matrix carrier with a bond strength in shear of at least 5,000 pounds per square inch.

4,943,489

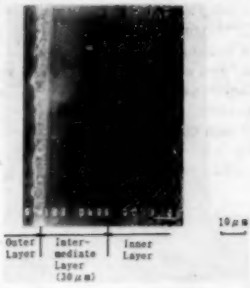
COMPOSITE PIPE HAVING EXCELLENT CORROSION RESISTANCE AND MECHANICAL PROPERTIES TO WITHSTAND HIGH TEMPERATURES AND HIGH PRESSURES

Akio Kuhara; Akira Yoshitake; Takeshi Torigoe, and Shinji Amako, all of Hirakata, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed May 23, 1989, Ser. No. 355,584

Int. Cl.[5] B32B 15/00

U.S. Cl. 428—586 **7 Claims**



1. A composite pipe having excellent corrosion resistance and mechanical properties to withstand high temperatures and high pressures, the composite pipe being characterized in that the pipe comprises an outer layer of a material consisting essentially of % by weight 0.05to 0.20% of C, up to 1.0% of Si, up to 2.0% of Mn, up to 1.0% of Cr, 0.2 to 2.0% of Ni, up to 1.0% of Mo, 0.05to 0.15% of V, up to 0.1% of Al, and the balance inevitable impurities and Fe, the material being up to 0.45% in carbon equivalent expressed by:

$$\text{carbon equivalent (\%)} = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Ni}{15},$$

an inner layer made of stainless steel, high alloy steel or like corrosion resistant alloy, and an intermediate layer substantially intermediate between the outer layer and the inner layer in composition and having a thickness of 10 to 100 μm, the intermediate layer providing a boundary between the outer and inner layers and being metallurgically joined to the outer layer and the inner layer integrally therewith.

4,943,490

CAST COMPOSITE MATERIAL HAVING A MATRIX CONTAINING A STABLE OXIDE-FORMING ELEMENT

Richard S. Bruski, Encinitas; Larry G. Hudson, Carlsbad, and Michael D. Skibo, Leucadia, all of Calif., assignors to Dural Aluminum Composites Corp., San Diego, Calif.

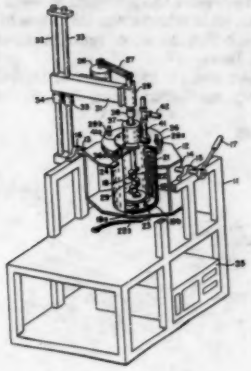
Filed Aug. 7, 1989, Ser. No. 391,087

Int. Cl.[5] C22C 21/00

U.S. Cl. 428—614 **11 Claims**

1. A composite material, comprising:

a matrix of an aluminum-containing alloy, the matrix further containing from about 15 to about 130 parts per million by



weight of an oxide-forming element that forms an oxide more stable than magnesium oxide; and

a reinforcement material distributed through the matrix.

4,943,491

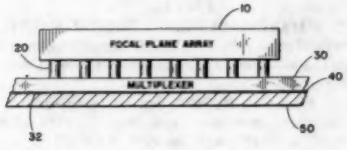
STRUCTURE FOR IMPROVING INTERCONNECT RELIABILITY OF FOCAL PLANE ARRAYS

Peter W. Norton, Littleton; James A. Stobie, Westford, and Peter H. Zimmermann, Lexington, all of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 20, 1989, Ser. No. 438,241

Int. Cl.[5] H01L *27/14*; G01J *1/00*

U.S. Cl. 428—620 **19 Claims**



1. An improved structure for interconnecting focal plane arrays comprising:

(a) a first body having a first coefficient of thermal expansion comprising a detector array;

(b) a second body having a second coefficient of thermal expansion comprising semiconductor electronics having a bottom surface;

(c) means for interconnecting the first and second bodies; and

(d) a layer of material bonded with adhesive to the second body's bottom surface wherein the bonded layer has a third coefficient of thermal expansion greater than the first and second coefficients of thermal expansion.

4,943,492

WELDING ALUMINIUM ALLOYS

Nigel J. H. Holroyd, Brackley, and Geoffrey M. Scamans, Banbury, both of England, assignors to Alcan International Limited, Montreal, Canada

Filed Feb. 26, 1988, Ser. No. 160,719

Int. Cl.[5] B32B *15/01, 15/20*

U.S. Cl. 428—654 **23 Claims**

1. A welded structure in which two Al alloy components are joined together by means of a weld bead which is at least partly covered by a surface layer of an Al alloy, wherein the surface layer has the composition in weight %:

Zn	0-7.0
Mn	0-5.0
In	0.02-0.4
Ga	0-0.2
Mg	0-6.0

balance Al of at least commercial purity, the In being present substantially in solid solution, with the proviso that, in the absence of added Mg or Mn, the In concentration is not more than 0.16%.

4,943,493

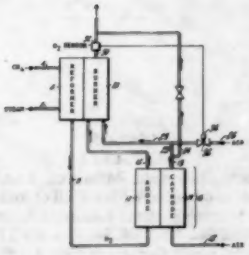
FUEL CELL POWER PLANT

George Vartanian, Ellington, Conn., assignor to International Fuel Cells Corporation, South Windsor, Conn.

Filed Apr. 21, 1989, Ser. No. 342,003

Int. Cl.[5] H01M *8/06*

U.S. Cl. 429—17 **5 Claims**



1. A fuel cell power plant, comprising:

a fuel cell, including an anode and a cathode for electrochemically reacting a fuel stream and a first oxidant stream to produce electricity, an anode exhaust stream and a cathode exhaust stream,

means for diluting an air stream with cathode exhaust to provide a second oxidant stream,

a burner for combusting a mixture of the anode exhaust stream and the second oxidant stream to produce heat and a burner exhaust stream, said burner exhaust stream having an oxygen content,

means for sensing the oxygen content of the burner exhaust stream, and

means, responsive to the sensing means, for controlling the mass flow rate of the air stream to maintain the oxygen content of the burner exhaust within a preselected range.

4,943,494

SOLID OXIDE FUEL CELL MATRIX AND MODULES

Brian Riley, Willimantic, Conn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 22, 1988, Ser. No. 184,918

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[5] H01M *8/10*

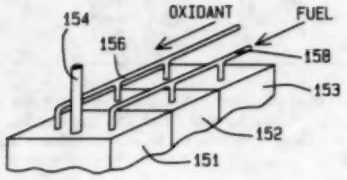
U.S. Cl. 429—30 **20 Claims**

1. A modular solid oxide fuel cell arrangement comprising:

a solid oxide fuel cell having an anode, a cathode and a solid electrolyte therebetween and responsive to an oxidant and a fuel gas provided thereto for converting chemical en-

ergy of said fuel gas to direct current electrical energy; and

block means coupled to said solid oxide fuel cell for providing support therefor, said block means including fuel and



oxidant delivery means for respectively providing fuel gas and oxidant to said fuel cell and further including exhaust means for removing exhaust gases from said solid oxide fuel cell.

4,943,495

FUEL CELL

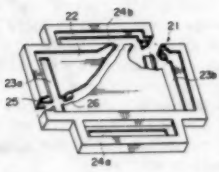
Tatsunori Okada; Masayuki Miyazaki; Toshihide Tanaka; Chiaki Hatoh, and Masahiro Mukai, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 13, 1989, Ser. No. 379,227

Claims priority, application Japan, Sep. 9, 1988, 63-226948

Int. Cl.[5] H01M *8/02*

U.S. Cl. 429—35 **8 Claims**



1. A fuel cell comprising:

an electrolyte layer;

a pair of electrode reacting portions disposed on both sides of said electrolyte layer; and

a pair of gas separating plates laminated on the outer sides of said electrode reacting portions, respectively, said gas separating plates are provided so as to form gas flow passages through which different types of gas fluid are caused to flow so that they can be electrochemically reacted in said respective electrode reacting portions;

said fuel cell is fabricated by laminating said electrolyte layer, said electrode reacting portions and said gas separating plates;

sealed portions of each of said gas separating plates which are provided on the periphery of said gas flow passage having a U-shaped cross section with stems of the U extending substantially parallel to the layers of the lamination so that they may flex, and a filling member filled interior of said peripheral sealed portions.

4,943,496

FUEL CELL, ELECTRODE FOR THE CELL AND METHOD OF PREPARATION THEREOF

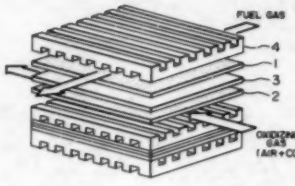
Hideo Okada; Toshikatsu Mori; Kouichi Mitsugi; Yoshio Iwase; Satoshi Kuroe, all of Hitachi; Masato Takeuchi, Katsuta, and Tomoichi Kamo, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 301,902

Claims priority, application Japan, Jan. 25, 1988, 63-12539

Int. Cl.[5] H01M *4/90*

U.S. Cl. 429—45 **6 Claims**



1. A molten carbonate type fuel cell which comprises two electrodes, an electrolytic plate and two separators having gas-passing channels in a single unit, each of said two electrodes comprising a porous plate of an electron conductive material containing ceramic particles uniformly dispersed therein except for a superficial thin portion having a thickness of 0.001 to 0.1 mm free of the ceramic particles on a surface of the plate facing one of said two separators, wherein said electron conductive material is comprised of at least one metal selected from nickel, cobalt, copper, chromium and iron, and mixtures and alloys thereof, and wherein said ceramic particles are formed from a ceramics-affording source which is at least one compound of a metal selected from magnesium, zirconium, aluminum, lanthanum, silicon and yttrium, and mixtures thereof.

4,943,497

CELL HAVING CURRENT CUTOFF VALVE

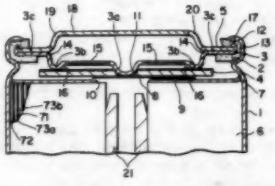
Shigeru Oishi; Takao Abe; Toru Nagaura, and Mochiyuki Watanabe, all of Fukushima, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 20, 1989, Ser. No. 424,696

Claims priority, application Japan, Oct. 21, 1988, 63-265783; Apr. 25, 1989, 1-105197; Apr. 26, 1989, 1-106584

Int. Cl.[5] H01M *2/12*

U.S. Cl. 429—53 **5 Claims**



1. A cell comprising:

a container having therein a generator unit formed of an anode, a cathode, a separator interposed between said anode and said cathode, and electrolyte;

an explosion proof valve sealing said container;

an electrical lead connected at one end to one of said anode or cathode and at the other end to said explosion proof valve; and a stripper element provided between said generator unit andd said explosion proof valve;

said explosion proof valve being deformable upon increase

of inner pressure of said container and said stripper element holding said electrical lead at a side of said generator unit to remove said electrical lead from said explosion proof valve upon deformation of said explosion proof valve.

4,943,498

BATTERY AND BATTERY RECEPTACLE ARRANGEMENT

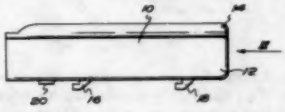
Robin A. Cooper, Surrey, and Barry J. Fazackerley, London, both of England, assignors to Hugh Steeper Limited, London, England

Filed Aug. 23, 1989, Ser. No. 397,735

Claims priority, application United Kingdom, Aug. 25, 1988, 8820230

Int. Cl.[5] H01M *2/10*

U.S. Cl. 429—97 **13 Claims**



1. A battery and battery receptacle arrangement, comprising (a) a battery as a first part of the arrangement, (b) a battery receptacle as a second part of the arrangement, (c) at least one formation provided on one of the parts, (c) a corresponding formation provided on the other part, which corresponding formation is engaged by the said at least one formation when the battery is inserted in the receptacle and moved transversely therewithin, thereby to retain the battery in the receptacle in a readily releasable manner.

4,943,499

CONDUCTOR POLYMERS USABLE IN THE CONSTRUCTION OF COMPLETELY DRY BATTERIES

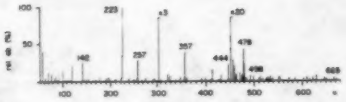
Giuseppe Casalbore-Miceli; Giancarlo Beggiato, both of Bologna; Pier G. DiMarco, San Lazzaro di Savena, and Gabriele Giro, Forlimpopoli, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Jun. 16, 1989, Ser. No. 367,124

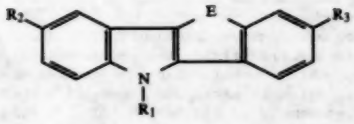
Claims priority, application Italy, Jun. 16, 1988, 20986 A/88

Int. Cl.[5] H01M *6/18*

U.S. Cl. 429—192 **20 Claims**



1. A conductor polymer usable in the construction of completely dry batteries and having a cross-linked structure with intermonomer bonds formed through a nitrogen-bonded vinyl group and/or an aromatic ring, and having delocalized positive charges in the polymer chain neutralized by a counter-ion comprising Cl^-, BF^-_4, ClO^-_4, PF^-_6, or mixtures thereof, prepared by anodic oxidation of a compound of general formula (I)



(I)

in which

E=O, S or Se;

R_1=H or a saturated or unsaturated alkyl radical with double bonds in the vinyl or allyl position with respect to the nitrogen;

R_2,R_3=H or a methyl radical.

4,943,500

SEALED ELECTROCHEMICAL CELL

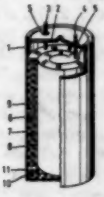
Johann R. G. C. M. Van Beek, Eindhoven, and Gerrit Frens, Eersel, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 5, 1989, Ser. No. 348,224

Claims priority, application Netherlands, May 11, 1988, 8801233

Int. Cl.[5] H01M *10/34*

U.S. Cl. 429—207 **2 Claims**



1. A sealed electrochemical cell comprising a negative electrode whose electrochemically active material includes an intermetallic compound which can form a hydride with hydrogen, the cell comprising an electrolyte of a solution of at least one alkali hydroxide in water, and the negative electrode having a discharge buffer, characterized in that the discharge buffer is formed by one of an alkali metal, an alkaline earth metal or aluminum in contact with the electrolyte.

4,943,501

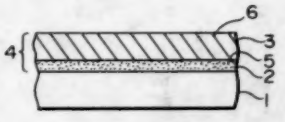
PHOTOCONDUCTIVE MATERIAL CONTAINING ANTI-OXIDANT

Akira Kinoshita, Hino; Yumi Matsuzawa, Fuchu, and Hideo Yoshizawa, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 167,505, Mar. 14, 1988, abandoned. This application Sep. 28, 1989, Ser. No. 415,390

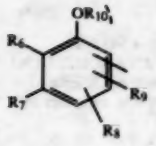
Int. Cl.[5] G03G *5/14*

U.S. Cl. 430—58 **12 Claims**



1. A photoconductive element comprising an electroconductive substrate and a photoconductive layer containing a photoconductive substance, said photoconductive layer containing a compound which has in its molecular structure a hindered amine structure unit represented by formula Ia and a hindered phenol structure unit represented by formula Ib;

[Ia]


[Ib]

wherein, R_1, R_2, R_3 and R_4 are independently a hydrogen atom, an alkyl group or an aryl group; Z represents a group of atoms necessary to complete a nitrogen-containing alicyclic group; R_5 represents an alkyl group;

R_6 is a branched alkyl group; R_7, R_8 and R_9 are independently a hydrogen atom, a hydroxy group, an alkyl group or an aryl group; and R_{10} is a hydrogen atom, an alkyl group or an alkenyl group; provided that said hindered amine structure unit is connected through one of R_1, R_2, R_3, R_4, R_5 and Z thereof, optionally through a divalent organic group and/or one of R_6, R_7, R_8, R_9 and R_{10}, with said hindered phenol structure unit, and that R_8 and R_9 may be connected with each other to form a ring.

2. The photoconductive element according to claim 1, wherein said photoconductive layer contains charge generating material and a charge transporting material.

4,943,502

PHOTOSENSITIVE RECORDING MATERIAL SUITED FOR USE IN ELECTROPHOTOGRAPHY CONTAINING DIHYDROQUINOLINE CHARGE TRANSPORT COMPOUNDS

David R. Terrell, Lint; Marcel J. Monbaliu, Mortsel, both of Belgium; Ulrich Grigo, Kempen, and Klaus Berg, Krefeld, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

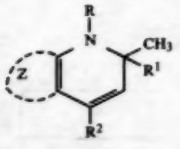
Filed Jun. 2, 1989, Ser. No. 360,303

Claims priority, application European Pat. Off., Jun. 23, 1988, 88201293.3

Int. Cl.[5] G03G *5/14*

U.S. Cl. 430—58 **12 Claims**

1. An electrophotographic recording material which comprises an electrically conductive support having thereon a charge generating layer in contiguous relationship with a charge transporting layer, wherein said charge transporting layer contains a 1,2-dihydroquinoline compound corresponding to the following general formula(I):


(I)

wherein:

R represents hydrogen or an aliphatic or cycloaliphatic group including these groups substituted by non-ionic substituents. each of R^1 and R^2 (same or different) represents a C_1–C_6 alkyl group or an aryl group, and

Z represents the atoms necessary to close an adjacent aromatic nucleus or aromatic ring system including such nucleus or ring system substituted with one or more substituents of non-ionic character.

4,943,503

AMORPHOUS SILICON PHOTORECEPTOR

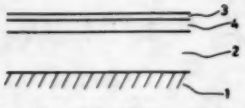
Hideo Nojima; Yoshimi Kojima; Eiji Imada, all of Nara; Toshiro Matsuyama; Takashi Hayakawa, both of Tenri; Shiro Narikawa, Kashihara, and Shaw Ehara, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 10, 1984, Ser. No. 659,418

Claims priority, application Japan, Oct. 13, 1983, 58-192078

Int. Cl.[5] G03G *5/14, 5/082*

U.S. Cl. 430—66 **10 Claims**



1. A photoreceptor for electrophotograph comprising:

a substrate of an electrically conductive material;

a photoconductive layer formed on said substrate, the main component of said photoconductive layer being amorphous silicon (a-Si);

an intermediate layer formed on said photoconductive layer, said intermediate layer being made of amorphous silicon (a-Si) including nitrogen and boron; and

a surface layer formed on said intermediate layer, said surface layer being made of an amorphous material, and showing a large optical band gap, wherein the energy difference between the bottom of the conduction bands of said surface layer and said intermediate layer is less than 0.2 eV.

4,943,504

METHOD FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE

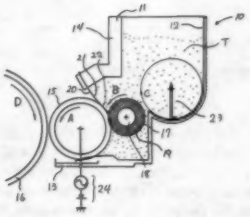
Shinya Tomura, Kanagawa, and Sachiko Yasuda, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 27, 1989, Ser. No. 303,458

Claims priority, application Japan, Jan. 29, 1988, 63-18921

Int. Cl.[5] G03G *13/08*

U.S. Cl. 430—102 **3 Claims**



1. A method for developing an electrostatic latent image, comprising the steps of:

forming an electrostatic latent image on the surface of an image holding member; and

supplying one-component developer particles to said electrostatic latent image from a developer transferring member spaced from the image holding member, said one-component developer having an amount of triboelectric charge within the range of about 30–100 $\mu c/m^2$ and a true specific gravity of at least about 1.2.

4,943,505

DEVELOPER AND TONER COMPOSITION PRODUCED BY EMULSION POLYMERIZATION

Takayoshi Aoki; Yukihiro Ishii; Koichi Tanaka, and Shigeru Sadamatsu, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,902

Claims priority, application Japan, Mar. 6, 1984, 59-41304; Mar. 6, 1984, 59-41312

Int. Cl.[5] G03G 9/08

U.S. Cl. 430—109 12 Claims

1. A toner composition comprising a toner powder and a fine powder having a particle size of from 0.05 to 5 μm and which is smaller than that of the toner powder, wherein said fine powder is present in an amount of from 0.01 to 10 wt % of the toner powder and is made of a polymer obtained by emulsion polymerization of a hydrophilic monomer using a persulfate salt type initiator in the absence of an emulsifier wherein said hydrophilic monomer is selected from the group consisting of methyl acrylate, ethyl acrylate, propyl acrylate, butyl acrylate, methyl methacrylate, ethyl methacrylate, propyl methacrylate, butyl methacrylate, acrylic acid, methacrylic acid, vinyl acetate, and acrylonitrile.

4,943,506

WHITE TONER COMPRISING TITANIUM OXIDE OF SPECIFIED SIZE

Ichiro Demizu; Mitsutoshi Nakamura, and Toshitaro Kohri, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 19, 1988, Ser. No. 259,749

Claims priority, application Japan, Oct. 19, 1987, 62-264214; Oct. 19, 1987, 62-264211; Oct. 19, 1987, 62-264213; Oct. 19, 1987, 62-264215

Int. Cl.[5] G03G 9/08

U.S. Cl. 430—109 7 Claims

1. White toner for use in forming images by dry process comprising binder resin and titanium dioxide with 0.20–0.35 μm in mean particle size at the content of 15–60 parts by weight on the basis of 100 parts by weight of the binder resin; the luminous reflectance is at least 20% when the white toner is fixed on a black paper with 8% or less of reflectivity.

4,943,507

TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE AND METHOD FOR DEVELOPING ELECTROSTATIC LATENT IMAGE WITH THE SAME

Jiro Takahashi; Kenzi Tsuzita; Hiroyuki Takagiwa; Kunio Shigeta, and Hiroya Masaki, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 22,777, Mar. 6, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,734

Claims priority, application Japan, Mar. 11, 1986, 61-51330

Int. Cl.[5] G03G 13/09

U.S. Cl. 430—120 26 Claims

1. A method of developing an electrostatic latent image comprising;

forming an electrostatic latent image with a negative polarity on an organic photoreceptor, and

developing said electrostatic latent image with a toner bearing a positive electric charge, said toner comprising

(a) a binder resin,

(b) a coloring agent,

(c) at least one oxide selected from the group consisting of hydrophobic aluminum oxide and hydrophobic titanium oxide,

(d) silica, and

(e) zinc stearate.

4,943,508

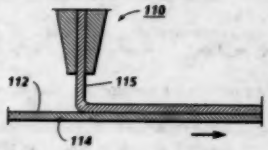
METHOD OF FABRICATING A LAYERED FLEXIBLE ELECTROPHOTOGRAPHIC IMAGING MEMBER

Robert C. U. Yu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

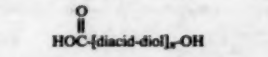
Filed Jul. 3, 1989, Ser. No. 375,423

Int. Cl.[5] G03G 5/04, 5/14

U.S. Cl. 430—129 20 Claims



1. A process for fabricating an electrophotographic imaging member comprising providing an electrically conductive layer, forming a charge blocking layer comprising an aminosilane reaction product on said electrically conductive layer, extruding a ribbon of a solution comprising a copolyester resin dissolved in at least a first solvent on said electrically conductive layer to form a wet adhesive layer on said charge blocking layer, drying said wet adhesive layer to remove substantially all of said first solvent to form a dry continuous adhesive layer comprising said adhesive polymer having a thickness between about 0.08 micrometer and about 0.3 micrometer, applying to said dry continuous adhesive layer comprising said copolyester resin a mixture comprising charge generating particles dispersed in a solution of a film forming binder polymer dissolved in at least a second solvent to form a wet charge generating layer, said binder polymer being miscible with said copolyester resin, drying said wet charge generating layer to remove substantially all of said second solvent, and applying a charge transport layer, said copolyester resing consisting essentially of a linear saturated copolyester reaction product of ethylene glycol and four diacids, said copolyester resin having the following formula:



wherein said diol is ethylene glycol, said diacids are terephthalic acid, isophthalic acid, adipic acid and azelaic acid, the mole ratio of said terephthalic acid to said isophthalic acid to said adipic acid to said azelaic acid is between about 3.5 and about 4.5 for terephthalic acid: between about 3.5 and about 4.5 for isophthalic acid: between about 0.5 and about 1.5 for adipic acid: between about 0.5 and about 1.5 for azelaic acid, the total moles of diacid being in a mole ratio of diacid to ethylene glycol in the copolyester of about 1:1, n is a number between about 250 and about 400 and the T_g of said copolyester resin being between about 32° C. and about 50° C.

4,943,509

RECORDING SYSTEM HAVING A COATING DEVICE FOR COATING RECORDING MEDIUM OR PHOTOSENSITIVE MEDIUM WITH DEVELOPER MATERIAL REACTING WITH COLOR PRECURSOR

Jun Sakai; Shunichi Higashiyama, both of Nagoya; Koji Suzuki, Kasugai, and Mitsuru Ohta, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 24, 1988, Ser. No. 159,736

Claims priority, application Japan, Feb. 27, 1987, 62-45687; Feb. 27, 1987, 62-45690; Jun. 17, 1987, 62-150901; Aug. 6, 1987, 62-196669

Int. Cl.[5] G03C 1/40

U.S. Cl. 430—138 19 Claims

1. A recording system, comprising:

a pressure-sensitive photosensitive medium having a layer of microcapsules whose mechanical strength varies according to an amount of exposure to a radiation, each of said microcapsules containing a chromogenic material capable of chemically reacting with a developer material;

an exposing device operated according to source image information, for image-wise exposing said layer of microcapsules to said radiation to thereby form thereon latent images corresponding to said source image information, based on variations in said mechanical strength of said microcapsules;

a coating device for applying said developer material to a recording medium, to thereby prepare a developing sheet; and

a developing device for superposing said developing sheet on said pressure-sensitive photosensitive medium after said layer of microcapsules have been image-wise exposed, and for applying a pressure to the image-wise exposed layer of microcapsules in contact with said developing sheet, to thereby cause a chemical reaction of said chromogenic material with said developer material, for developing said latent images into visible images on said developing sheet.

4,943,510

POLYESTER FILM

Klaus Thoese, and Karl-Heinz Jung, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt/Main, Fed. Rep. of Germany

Division of Ser. No. 133,486, Dec. 15, 1987, Pat. No. 4,876,155. This application Jul. 20, 1989, Ser. No. 382,308

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642848

Int. Cl.[5] G03C *1/52*; B32B *27/08, 27/36*

U.S. Cl. 430—160 **15 Claims**

1. A diazotype duplicating film comprising:

a base material comprising a biaxially stretch-oriented and heat-set polyester film;

a coating on a first surface of the polyester film comprising a copolyester, containing sulfonate groups, and an antistatically effective amount of at least one salt derived from an amino acid or a protein hydrolysate; and

a diazotype reproduction layer on the opposite surface of the film.

4,943,511

HIGH SENSITIVITY MID AND DEEP UV RESIST

Richard M. Lazarus, Mission Viejo; Edward J. Reardon, Laguna Niguel, and Sunit S. Dixit, Mission Viejo, all of Calif., assignors to Morton Thiokol, Inc., Chicago, Ill.

Continuation of Ser. No. 229,088, Aug. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 175,706, Mar. 31, 1988, abandoned. This application Jul. 6, 1989, Ser. No. 376,971

Int. Cl.[5] G03C *1/60*

U.S. Cl. 430—192 **9 Claims**

1. A positive photosensitive composition comprising an admixture of a 1,2-naphthoquinonediazide photosensitizer and a bindingly effective amount of novolak resin wherein:

A. said photosensitizer comprises an admixture of 2,3,4-trihydroxybenzophenone-1,2-naphthoquinone-2-diazo-4-sulfonic acid triester; 2,3,4-trihydroxybenzophenone-1,2-naphthoquinone-2-diazo-4-sulfonic acid diester, and 2,3,4-trihydroxybenzophenone-1,2-naphthoquinone-2-diazo-4-sulfonic acid monoester in the following relative amounts: triester—about 50 wt % to about 75 wt %

monoester and diester—balance, in a monoester/diester weight ratio of about ½, said wt % being based on the total weight of the mono-, di, and triester; and

B. said novolak resin comprising a resin selected from the group consisting of:

1. a resin prepared by condensing an aliphatic aldehyde, aromatic aldehyde or mixture thereof with a phenolic component comprising a mixture of p-cresol and m-cresol containing at least about 60 weight percent p-cresol, based on the total weight of p-cresol and m-cresol, and a sufficient amount of m-cresol to render said novolak resin soluble in an aqueous, alkaline solution, said phenolic component being essentially free of o-cresol; and

2. a novolak resin which is the condensation product of (a) a mixture of m-cresol and p-cresol and (b) a mixture of formaldehyde or a formaldehyde precursor and a monohydroxy aromatic aldehyde selected from the group consisting of 2-hydroxybenzaldehyde, 3-hydroxybenzaldehyde and 4-hydroxybenzaldehyde

wherein the cresol and aldehyde components used to prepare said novolak resin B2 are used in the following amounts:

$$\frac{\text{moles total aldehyde component}}{\text{moles total cresol component}} \times 100 = \text{about 60\% to about 95\%}$$

$$\frac{\text{moles aromatic aldehyde}}{\text{moles total aldehyde}} \times 100 = \text{about 15\% to about 95\%.}$$

4,943,512

PHOTOCURABLE AND DYEABLE RESIN COMPOSITION WITH BISAZIDE AND DYEABLE ACRYLIC COPOLYMER

Hiroshi Kawabata; Katsuhiko Kobayashi, and Hideo Sato, all of Yokohamashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Oct. 4, 1988, Ser. No. 253,078

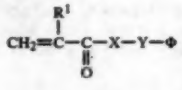
Claims priority, application Japan, Nov. 12, 1987, 62-286184

Int. Cl.[5] G03C *1/60, 1/71*

U.S. Cl. 430—197 **15 Claims**

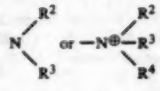
1. A photocurable, photosensitive and dyeable resin composition which comprises a mixture of

(A) a polymer which is obtained by a copolymerizable of a first monomer of the general formula [I]

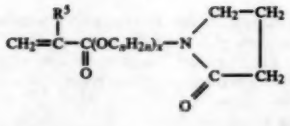


[I]

in which R^1 represents H, CH_3 or C_2H_5, X represents —O— or —NH—, Y represents a linear or branched hydrocarbon group having from 1 to 4 carbon atoms, and Φ represents



$Z^{\ominus}$, in which $Z^{\ominus}$ represents an anion, and R^2, R^3 and R^4 are independently an alkyl group having from 1 to 4 carbon atoms, and at least one other monomer of the general formula [II]



[II]

in which R^5 represents H, CH_3 or C_2H_5, and n and x are independently an integer of from 1 to 4; with

(B) a bisazide compound used as a photocross-linking agent for the polymer, the quantity of said bisazide compound being 1 to 10% by weight based on said polymer (A).

4,943,513

PHOTOIMAGEABLE COMPOSITION WITH REDUCED COLD FLOW DUE TO SALT-BRIDGING BY METAL IONS AND DRY FILM FORMED THEREFROM

Melvin A. Lipson, Newport Beach; Thomas P. Carter, Laguna Beach; James G. Shelnut, Lake Forest, and Leo Roos, Laguna Beach, all of Calif., assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Oct. 7, 1988, Ser. No. 255,579
Int. Cl.[5] G03C 1/90, 1/68
U.S. Cl. 430—260 13 Claims

1. A dry film comprising

a cover sheet having sufficient flexibility to be wound as a roll, and

a photoimageable composition layer on said cover sheet which is developable by alkaline aqueous or semiaqueous solutions, the solids of said photoimageable composition comprising between about 30 and about 80 wt. percent or a polymer containing carboxylic acid groups, between about 15 and about 65 wt. percent of a monomer or monomers capable of undergoing a photochemical reaction which cross-links said polymer and between about 0.0004 and about 5 wt. percent of a photoinitiator, the improvement comprising, said photoimageable composition containing metal ions of charge 2^+ or higher salt-bridging carboxylic acid groups of different polymer molecules, which salt-bridging reduces cold flow in the photoimageable composition layer.

4,943,514

NEGATIVE-WORKING DYEABLE PHOTORESIST

Raymond F. Reithel, and Richard C. Sutton, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1988, Ser. No. 211,810
Int. Cl.[5] G03C 1/66
U.S. Cl. 430—270 4 Claims

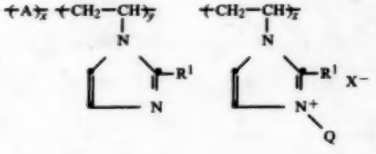
1. A negative-working dyeable photoresist composition comprising in admixture

(a) a poly(vinyl alcohol) binder,

(b) a radiation-sensitive dichromate, and

(c) a polymeric mordant comprising recurring units derived from a quaternized N-vinylimidazole

wherein said polymeric mordant contains recurring units:



wherein:

A is a unit derived from an ethylenically unsaturated monomer;

each R^1 is independently H or methyl;

Q is alkyl or aryl;

X—is an acid anion;

x is 0 to 65 mole percent;

y is 0 to 65 mole percent; and

z is 5 to 50 mole percent.

4,943,515

INFORMATION RECORDING MEDIUM

Masaki Okazaki, Minami-ashigara; Masao Yabe, Fujinomiya, and Ken Kawatta, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 134,058, Dec. 17, 1987, abandoned. This application Feb. 10, 1989, Ser. No. 310,023
Claims priority, application Japan, Dec. 17, 1986, 61-302100
Int. Cl.[5] G11B 7/24; G03C 1/72, 5/16; B41M 5/26
U.S. Cl. 430—270 12 Claims

1. A method for recording information comprising irradiating a recording medium which comprises a substrate and a recording layer containing an organic solvent-soluble silver salt and a dye having at least one chromophore selected from the group consisting of an amidinium ion chromophore, a carboxyl ion chromophore and a dipolar amide chromophore, with a laser beam to form pits corresponding to the information in the recording layer.

4,943,516

PHOTOSENSITIVE THERMOSETTING RESIN COMPOSITION AND METHOD OF FORMING SOLDER RESIST PATTERN BY USE THEREOF

Yuichi Kamayachi; Kenji Sawazaki; Morio Suzuki, and Shoji Inagaki, all of Saitama, Japan, assignors to Taiyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1988, Ser. No. 274,966
Claims priority, application Japan, Nov. 30, 1987, 62-299967
Int. Cl.[5] G03F 7/027; G03C 1/72
U.S. Cl. 430—280 28 Claims

1. A photosensitive thermosetting-resin composition, comprising (A) a potosensitive prepolymer containing at least two ethylenically unsaturated bonds in the molecular unit thereof, (B) a photoinitiator, (C) a photopolymerizable vinyl monomer and/or an organic solvent as a diluent, and (D) a finely powdered epoxy compound containing at least two epoxy groups in the molecular unit thereof and exhibiting sparing solubility in the diluent to be used.

4,943,517

IMAGING SYSTEM

Stephen R. Powers; Peter J. Finn, both of Harlow, and Michael G. Fisher, Epping, all of England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 37,953, Apr. 13, 1987. This application Sep. 30, 1988, Ser. No. 251,342
Claims priority, application United Kingdom, Apr. 15, 1986, 8609137
Int. Cl.[5] G03C 5/08, 5/16
U.S. Cl. 430—301 11 Claims

1. An imaging process which comprises the steps of:

(i) providing a first radiation sensitive element comprising a transparent base having coated thereon only three imaging media, each of said three media being capable of forming a colour image upon imagewise exposure and processing, each of said imaging media being capable of forming a colour image and having a maximum sensitivity at a wavelength different from the wavelengths of the maximum sensitivity of the other imaging media being capable of forming a colour image and the wavelength of the maximum absorption of the colour image formed by each imaging medium differing from the wavelength of the maximum absorption of the colour image formed by the other imaging media by at least 40 nm;

(ii) obtaining colour separation information representative of the cyan, magenta, and yellow content of a colour original or electronically generated image,

(iii) exposing said first radiation sensitive element of step (i) to three independently modulated sources of radiation from 550 to 900 nm, each source being modulated by said colour separation information with respect to one colour and emitting radiation at a wavelength in the region of the

wavelength of maximum sensitivity of one of said imaging media capable of forming a colour image such that a latent image representative of at least the cyan, magenta, and yellow information of step (ii) is formed in individual colour forming media;

(iv) processing said exposed radiation sensitive element to produce a transparency comprising three colour images, a first colour image being representative of the colour separation information for cyan, a second colour image being representative of the colour separation information for magenta, and a third colour image being representative of the colour separation information for yellow,

(v) exposing a second radiation sensitive element comprising a base having at least one imaging medium coated thereon through said transparency produced in step (iv) to record on said second radiation sensitive element an image corresponding to one or more of the images of said imaging media of the transparency,

wherein each imaging medium of said three imaging media within said first element has a sensitivity at the wavelengths of maximum spectral sensitivity of the other imaging media which is not significant with respect to said sensitivity at the wavelength corresponding to the maximum spectral sensitivity of said other imaging media, and wherein exposing of said first radiation sensitive element comprises a false color address of a medium, and wherein said first radiation sensitive element comprises a transparent substrate bearing three separate imaging media coated thereon, said imaging media including:

(1) an imaging medium capable of forming a first colour image upon imagewise exposure and processing,

(2) an imaging medium capable of forming a second colour image upon imagewise exposure and processing, and

(3) an imaging medium capable of forming a third colour image upon imagewise exposure and processing,

each imaging medium having a maximum spectral sensitivity at a wavelength within the range 400 to 900 nm and different from that of the maximum sensitivity of the other imaging media by at least 20 nm, the exposure of step (iii) being conducted in half-tone.

4,943,518

DIRECT-POSITIVE SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL AND METHOD OF PROCESSING IT

Tomomi Yoshizawa; Keiji Ogi, both of Tokyo; Yasuo Tosaka; Kazuya Kuramoto, both of Odawara, and Yoshiyuki Nonaka, Odawara, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 288,022

Claims priority, application Japan, Dec. 23, 1987, 62-326066; Feb. 29, 1988, 63-47179

Int. Cl.[5] G03C *7/38, 7/30*

U.S. Cl. 430—378 **51 Claims**

22. A method for forming a direct positive image comprising

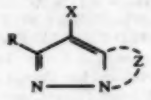
a step for imagewise exposing to light a silver halide photographic light-sensitive material which comprises a support having thereon a blue-sensitive emulsion layer containing a yellow color coupler, at least one green-sensitive emulsion layer and a red-sensitive emulsion layer containing a cyan color coupler, and

a step for developing said silver halide photographic light-sensitive material with a color developer in the presence of a fogging agent,

wherein the green-sensitive emulsion comprises

silver halide grains having at least two peaks on the size distribution curve thereof, where the grain size corresponding to the smallest grain size peak among said at least two peaks is not more than 0.3 μm; and

at least one of the magenta coupler represented by the following Formula (M-1);



Formula (M-I)

wherein Z represents a group of non-metal atoms necessary to complete a nitrogen containing heterocyclic ring which may have a substituent; X represents a hydrogen atom or a group capable of being split off upon reaction with the oxidized product of a color developing agent; and R represent a hydrogen atom or a substituent.

4,943,519

LIGHT SENSITIVE, STABILIZED PHOTOGRAPHIC RECORDING MATERIAL

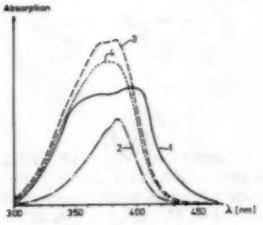
Günter Helling, Odenthal; Johannes Sobel, Leverkusen, and Hans Langen, Bona, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 7, 1986, Ser. No. 816,746

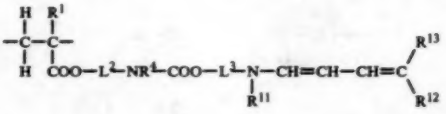
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3501722

Int. Cl.[5] G03C *1/84*

U.S. Cl. 430—512 **2 Claims**



1. Photographic recording material having at least one light sensitive silver halide emulsion layer, and at least one UV-stabilizer present in a polymeric form, in an amount of 50 to 1000 mg/m^2 of recording material, characterized in that the Uv-stabilizer has recurrent structural units corresponding to the following formula



wherein

R^1 denotes H or CH_3

R^4 denotes H or CH_3,

L^2 and L^3, which may be identical or different, denote ethylene, propylene or butylene,

R^{11} denotes an unsubstituted or substituted alkyl group,

R^{12} denotes a cyano group or $-SO_2R^{14}$,

R^{13} denotes CN or $COOR^{15}$, and

R^{14}/R^{15}, which may be identical or different, denote an unsubstituted or substituted alkyl group having 1–20 carbon atoms or an unsubstituted or substituted aryl group having 6–20 carbon atoms.

4,943,520
SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING ANTISTATIC AGENTS

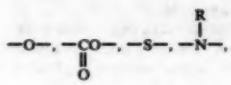
Masakazu Yoneyama, and Yasuo Mukunoki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 25, 1988, Ser. No. 185,224
Claims priority, application Japan, Apr. 24, 1987, 62-101455
Int. Cl.[5] G03C *1/94*
U.S. Cl. 430—527 **8 Claims**

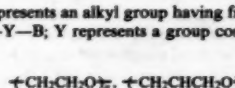
1. A silver halide photographic element comprising a support having thereon at least one hydrophilic colloid layer, at least one layer of which is a photosensitive silver halide emulsion layer, at least one hydrophilic colloid layer selected from a photosensitive silver halide emulsion layer, a surface protective layer, a backing layer, an interlayer and a subbing layer contains a compound represented by formula (I) in an amount of from about 0.0001 to about 2g/m^2 of the photographic element:

$$A—X—Y—B \qquad (I)$$

wherein A represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group or a substituted or unsubstituted aralkyl group, each having from 8 to 25 carbon atoms; X represents



R represents an alkyl group having from 1 to 10 carbon atoms or —Y—B; Y represents a group comprising units



wherein a is a number from 5 to 50; b is a number from 2 to 20; c is a number from 0 to 3; d is a number from 0 to 20; R′ represents a hydrogen atom, a method group or a phenyl group, with the proviso that, when R′ represents a methyl group or a phenyl group, c represents 0, and, when R′ represents a hydrogen atom, c represents a number from 1 to 3; and B represents a hydrogen atom, a substituted or unsubstituted alkyl group having up to 8 carbon atoms or a substituted or unsubstituted phenyl group.

4,943,521
METHOD FOR EVALUATING MUTAGENICITY

Gary R. Blackburn, Washington Crossing, Pa.; Carl R. Mackerer, Pennington, N.J., and Ceinwen A. Schreiner, Meadowbrook, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 24, 1987, Ser. No. 18,119
Int. Cl.[5] C12Q *1/68, 1/02, 1/18*
U.S. Cl. 435—6 **11 Claims**

1. A method for evaluating the relative mutagenic activity of a parent hydrocarbon mixture derived from petroleum, which method comprises:

contacting a sample of said hydrocarbon mixture with nitric acid under conditions effective to nitrate the mutagenic components thereof;

recovering from said nitric acid contacted hydrocarbon mixture a hydrocarbon mixture including nitrated mutagens;

incubating without addition of a liver metabolic activation system an inoculum of a histidine deficient strain of *Salmonella typhimurium* in the presence of said nitrated mutagens;

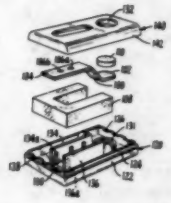
counting the number of revertant colonies so produced; and

comparing said number with those obtained by the same steps from a reference series of different petroleum derived hydrocarbon mixtures of known mutagenic potency to determine the mutagenic potency of said nitrated mutagens, wherein the mutagenic potency of said nitrated mutagens correlates with the mutagenic potency of said parent hydrocarbon mixture.

4,943,522
LATERAL FLOW, NON-BIBULOUS MEMBRANE ASSAY PROTOCOLS

Robert W. Elsinger; Mohammed H. Khalil, both of San Diego; David H. Katz, La Jolla, and Robert B. Sargeant, Ramona, all of Calif., assignors to Quidel, San Diego, Calif.

Continuation-in-part of Ser. No. 57,273, Jun. 1, 1987, abandoned, and a continuation-in-part of Ser. No. 57,271, Jun. 1, 1987, abandoned. This application Aug. 10, 1988, Ser. No. 230,642
Int. Cl.[5] G01N *33/53*
U.S. Cl. 435—7 **46 Claims**



24. The method of claim 23 wherein the antigen is a soluble antigen.

4,943,523
DETECTABLE MOLECULES, METHOD OF PREPARATION AND USE

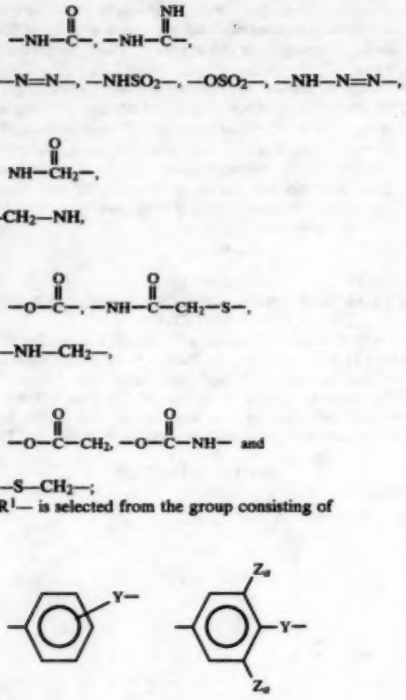
Jannis G. Stavrianopoulos, New York, N.Y., assignor to Enzo Biochem, Inc., New York, N.Y.

Division of Ser. No. 575,396, Jan. 30, 1984. This application Apr. 28, 1987, Ser. No. 43,670
Int. Cl.[5] G01N *33/53*
U.S. Cl. 435—7 **42 Claims**

1. A detectable molecule of the formula A^3—(X—R^1—E—$Det^b)_m$ where A^3 is A^2, an oligo-or polysaccharide, an olgo- or polypeptide or a synthetic polymer, each of said oligo- or polysaccharide, oligo- or polypeptide or synthetic polymer having at least one modifiable reactive group consisting of amino, hydroxy, 1,2-cis diOH, halide aryl, imidazoyl, carbonyl, carboxyl, thiol or a residue comprising an activated carbon;

A^2 is a specific binding ligand other than an oligo- or polysaccharide, oligo- or polypeptide or an oligo- or polymucleotide and has a molecular weight of less than about 2,000;

—X— is selected from the group consisting of



and a C_1–C_{10} branched or unbranched alkyl or aralkyl, which may be substituted by —OH;

—Y— is a direct bond to —E—, or —Y— is —E—R^2— where $-R^2$— is a C_1–C_{10} branched or unbranched alkyl;

Z_a is chlorine, bromine or iodine;

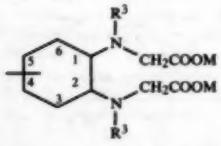
—E— is O, NH or an acyclic divalent sulfur atom;

Det^b is a chemical moiety capable of being detected, comprising biotin or a substituted or unsubstituted metal chelator or a compound capable of yielding a metal chelator; and

m is an integer from 1 to the total number of modified reactive groups on A^3.

2. A specific binding assay method for determining the presence or absence of an analyte in a sample, which method comprises

(a) contacting said sample with a composition comprising the molecule of claim 1 wherein A^3 is a specific binding partner for said analyte, and Det^b has the formula



wherein M is a radiometal;

(b) separating any complex formed between said detectable molecule and said analyte; and

(c) observing the amount of detectable complex so-formed.

4,943,524

ENZYME IMMUNOASSAY FOR CANCER PROCOAGULANT

Stuart G. Gordon, Denver, Colo., assignor to The University of Colorado Foundation, Inc., Boulder, Colo.

Continuation of Ser. No. 69,454, Jul. 2, 1987, abandoned, which is a continuation of Ser. No. 606,330, May 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 391,278, Jun. 23, 1982, Pat. No. 4,461,833. This application Feb. 17, 1989, Ser. No. 313,285

Int. Cl.[5] G01N *33/53, 33/531, 5/00*; **C12P** *21/00*

U.S. Cl. 435—7 **9 Claims**

2. A method for producing monoclonal antibody to cancer procoagulant comprising the steps of:

(a) immunizing an animal with cancer procoagulant antigen;

(b) fusing spleen cells from said immunized animal with myeloma cells to form hybrid cells;

(c) culturing said hybrid cells in a selective medium;

(d) testing for the presence of the desired antibody;

(e) cloning cells producing the desired antibody;

(f) subjecting medium from said cells producing the desired antibody to the step of dissociating said antibody from cancer procoagulant antigen produced by the hybrid cells used for the production of said antibody; and

(g) isolating the desired antibody.

4,943,525

SIMULTANEOUS IMMUNOASSAY FOR THE DETERMINATION OF ANTIGENS AND ANTIBODIES

Elliott Dawson, Bellbuckle, Tenn., assignor to BioVentures, Inc., Murfreesboro, Tenn.

Filed Nov. 2, 1987, Ser. No. 115,955

Int. Cl.[5] G01N *33/53, 33/536, 33/542*; **C12Q** *1/34*

U.S. Cl. 435—7 **21 Claims**

1. An immunochemical assay to determine the presence or concentration of an antigenic substance in a fluid, comprising:

(a) contacting with said fluid to form a complex with said antigenic substance if any said antigenic substance is present is said fluid:

(1) a first aliquot of an antibody or antibody fragment conjugated to a first label and capable of binding with said antigenic substance, and

(2) a second aliquot of the same antibody or antibody fragment conjugated to a second label;

(3) said first or second label capable of reacting with a substrate to produce a reaction product which can interact with said other first or second label to generate a signal, and

(b) detecting the presence or absence of a signal as a determination of the presence or concentration of said antigenic substance in said fluid.

4,943,526

GAMMA-GLUTAMYL-4-AZOANILIDES, PROCESS FOR THE PREPARATION THEREOF AND DIAGNOSTIC AGENTS CONTAINING THEM

Elli Rauscher, München, Fed. Rep. of Germany; John Griffiths, Garforth Leeds, and Leonard F. Dixon, W. Yorkshire, both of Great Britain, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Division of Ser. No. 7,077, Jan. 27, 1987, Pat. No. 4,769,447. This application Aug. 11, 1988, Ser. No. 231,079

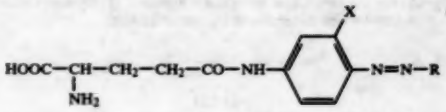
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1986, 3602443

Int. Cl.[5] C12Q *1/48, 1/36*

U.S. Cl. 435—15 **7 Claims**

1. In a method for the determination of gamma-glutamyl transferase wherein the transferase liberates a colored product from a substrate in the presence of an amino acid or peptide acceptor, and the rate of release of the colored product is measured optically as a measure of the transferase activity, the

improvement comprising using, as the substrate, the compound of the formula



(I)

wherein

X is C_1–C_7 alkyl, —$(CH_2)_m$—COOH or —O—$(CH_2)_n$—COOH wherein m is 0, 1, 2, 3 or 4 and n is 1, 2, 3 or 4;

R is p-nitrophenyl; p-nitrophenyl substituted one or more times by halogen, cyano, C_1–C_7 alkoxy, hydroxyl, C_1–C_7 alkyl, carboxy-C_1–C_7-alkyl, amino, C_1–C_7-alkyl-amino or di-C_1–C_7-alkyl-amino, the substituents being the same or different; or R is a thiophene, a thiophene substituted one or more times by cyano, nitro, C_1–C_7 alkyl or carboxy-C_1–C_7-alkyl, the substituents being the same or different; or R is a thiazole; a thiazole substituted one or more times by cyano, carboxyl or C_1–C_7 alkyl, the substituents being the same or different; or R is a benzothiazole, a benzothiazole substituted one or more times by C_1–C_7-alkoxy; or R is a benzoisothiazole; a benzoisothiazole which is substituted one or more times by nitro; or R is an N-C_1–C_7 alkyl-thiazole; a 1,3,5-thiodiazole or a 1,3,5-thiodazole which is substituted one or more times by C_1–C_7alkylthio; or

an alkali metal, alkaline earth metal or ammonium salt thereof.

4,943,527

MATURE APOAI PROTEIN PRODUCTION UNDER SERUM FREE CULTURING CONDITIONS

Andrew A. Protter, Palo Alto; Jean-Louis Vigne, San Francisco; Joanne B. Mallory, San Jose; Karen D. Talmadge, Palo Alto, and John P. Kane, Hillsborough, all of Calif., assignors to California Biotechnology Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 804,692, Dec. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 784,418, Oct. 4, 1985, abandoned. This application Feb. 27, 1986, Ser. No. 834,300

Int. Cl.[5] C12P *21/05, 21/02;* C12N *15/00*

U.S. Cl. 435—69.6 **4 Claims**

1. A method of producing purified human apoAI comprising:

providing a Chinese hamster ovary (CHO) cell transformed with an expression vector comprising a regulatable human metallothionein II gene promoter, and an expressible, heterologous gene coding for prepro apoAI,

culturing the cell in a serum-free medium under promoter-induction conditions wherein a mixture of extracellular proteins containing mature apoAI is produced,

forming a lipoprotein complex composed of endogenous CHO cell lipid particles and associated apoAI, and

separating the lipoprotein complex from nonlipid-binding proteins in the extracellular medium by floatation.

4,943,528

PROCESS FOR THE PRODUCTION OF OPTICALLY ACTIVE (R)-(−)-3-HALO-1,2-PROPANEDIOL

Tetsuji Nakamura, and Ichiro Watanabe, both of Kanagawa, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Nov. 20, 1989, Ser. No. 438,124

Claims priority, application Japan, Nov. 22, 1988, 63-293615; Apr. 21, 1989, 1-100173

Int. Cl.[5] C12P *7/18*

U.S. Cl. 435—158 **2 Claims**

1. A process for the production of an optically active (R)-(−)-3-Halo-1,2-propanediol which comprises contacting a 1,3-dihalo-2-propanol with a dehalogenase originating from a microorganism.

4,943,529

KLUYVEROMYCES AS A HOST STRAIN

Johan A. Van den Berg, Ad Reeuwijk; Albert J. J. Van Ooyen, AR Voorburg, and Krijn Rietveld, TL Vlaardingen, all of Netherlands, assignors to Gist-brocades NV, Delft, Netherlands

Continuation-in-part of Ser. No. 572,414, Jan. 19, 1984, Pat. No. 4,859,596. This application Jul. 28, 1987, Ser. No. 78,539

Int. Cl.[5] C12N *15/00, 1/20, 5/00*

U.S. Cl. 435—172.3 **16 Claims**

1. A method for transforming Kluyveromyces yeast cells which comprises:

pretreating said yeast cells with a chaotropic ion at a concentration of about 2 mM to about 1 M then treating said yeast cells with about 25–50% polyethylene glycol, wherein said pretreating and said treating is for about 5 to 120 minutes;

incubating said yeast cells with a DNA construct at about 20° C. to 35° C. for about 5 to 60 minutes;

heating said yeast cells with polyethylene glycol at about 35° C. to about 45° C. for about 1 to 10 minutes; and

growing said yeast cells.

4,943,530

LIQUID ENZYME PREPARATIONS

Juergen Christner, Bickenbach; Ernst Pfleiderer, Darmstadt-Arheilgen; Tilman Taeger, Seeheim-Jugenheim, and Ursula Bernschein, Gross-Gerau, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 152,020, Feb. 3, 1988. This application Oct. 16, 1989, Ser. No. 421,576

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1987, 3704465

Int. Cl.[5] C12N *9/96, 9/50, 9/20*

U.S. Cl. 435—188 **6 Claims**

1. A liquid enzyme formulation comprising at least one enzyme dispersed in a substantially anhydrous 5- or 6-membered cyclic carbonate ester as a liquid carrier vehicle therefor together with from 0.1 to 6 percent, by weight of said organic liquid, of a finely divided solid inroganic dispersing agent.

4,943,531

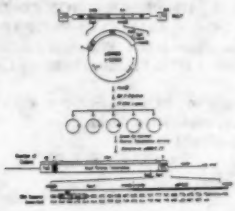
EXPRESSION OF ENZYMATICALLY ACTIVE REVERSE TRANSCRIPTASE

Stephen P. Goff, Tenafly, N.J.; Naoko Tanese, New York, and Monica J. Roth, Bronx, both of N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed May 6, 1985, Ser. No. 731,128

Int. Cl.[5] C12N *9/12, 1/20, 15/00*

U.S. Cl. 435—194 **3 Claims**



1. A plasmid designated pB6B15.23 having the restriction map shown in Fig. 2 and deposited in *Escherichia coli* HB101 under ATCC Accession No. 39939.

2. An Escherichia coli HB101 cell which contains the plasmid of claim 1 and which is deposited under ATCC Accession No. 39939.

3. A method for producing a polypeptide having reverse transcriptase activity which comprises growing the *Escherichia coli* HB101 cell of claim 2 under suitable conditions permitting production of the polypeptide and recovering the polypeptide so produced.

4,943,532

ALKALI-RESISTANT CELLULASES AND MICROORGANISMS CAPABLE OF PRODUCING SAME

Shuji Kawai, Utsunomiya; Kazushi Oshino, Koshigaya; Hiromi Okoshi, Utsunomiya; Hajime Mori, Utsunomiya; Katsutoshi Ara, Utsunomiya; Susumu Ito, Utsunomiya, and Kikuhiko Okamoto, Koshigaya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Nov. 30, 1987, Ser. No. 126,739

Claims priority, application Japan, Dec. 5, 1986, 61-289812; Dec. 8, 1986, 61-292156; Dec. 9, 1986, 61-293077; Dec. 9, 1986, 61-293078; Jan. 27, 1987, 62-16553; Jan. 27, 1987, 62-16551; Jan. 27, 1987, 62-16552; Aug. 3, 1987, 62-194141

Int. Cl.[5] C12N *9/42;* C12R *1/07*

U.S. Cl. 435—209 **20 Claims**

1. A substantially pure alkali-resistant cellulase enzyme (K-534) having the following enzymatic properties:

(1) action:

acting well on cellulosic materials including carboxymethyl cellulose, cellulose, filter paper and microcrystalline cellulose causing them to be destroyed, thereby forming reducing sugars;

(2) substrate specificity;

having activity on carboxymethyl cellulose, cellulose powder, microcrystalline cellulose, filter paper and p-nitrophenyl cellobioside;

(3) working pH and optimum pH:

a working pH range from 3 to 12.5 and an optimum pH of about 6.5 with a relative activity of not less than 50% of the activity at an optimum pH being shown in the range of 4.5 to 10.5 ;

(4) pH stability:

very stable and not inactivated at a pH of 5 to 11 with an activity of not less than about 50% being maintained at a pH of 4.5 to 12.5;

(5) optimum temperature:

working temperature in a wide range of 15° to 85° C and an optimum temperature of about 70° C, in the range of 45° to 75° C, the activity is not less than 50% of the activity at the optimum temperature;

(6) molecular weight:

peaks for the molecular weight are at about 15,000 and about 30,000 (when determined by gel filtration).

4,943,533

HYBRID CELL LINES THAT PRODUCE MONOCLONAL ANTIBODIES TO EPIDERMAL GROWTH FACTOR RECEPTOR

John Mendelsohn, La Jolla, Calif.; Tomoyuki Kawamoto, Hiroshima, Japan; Gordon Sato, Lake Placid, N.Y., and J. Denry Sato, Duarte, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 585,300, Mar. 1, 1984, abandoned. This application Mar. 9, 1987, Ser. No. 23,988

Int. Cl.[5] C12N *5/00;* C12R *1/91;* C07K *15/12;* A61K *39/395*

U.S. Cl. 435—240.27 **8 Claims**

1. Hybridoma 579 that secretes monoclonal antibodies that inhibits epidermoid tumor cell growth, and on deposit with the American Type Culture Collection (ATCC) as CRL HB8506.

4,943,534

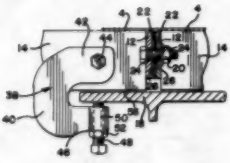
TRAY ASSEMBLY FOR GERMINATION FLOOR

Norman Andreasen, 1520 W. Norwood Ave., Itasca, Ill. 60143

Continuation of Ser. No. 248,312, Sep. 19, 1988, abandoned, which is a continuation of Ser. No. 103,593, Oct. 2, 1987, abandoned. This application Nov. 28, 1989, Ser. No. 442,450

Int. Cl.[5] C12C *1/06, 1/00*

U.S. Cl. 435—302 **10 Claims**



6. The tray assembly for the floor of a germination compartment comprising:

frame means having a top surface and a lowermost surface, said frame means including a pair of side members disposed in parallel relationship and a pair of cross members being respectively connected at each end to said pair of side members,

said frame means further including a plurality of spaced rib members extending parallel to said side members, said rib members being attached at each end to said cross members,

a perforated tray sheet being affixed to the top of said frame means,

a plurality of said frame means interconnected to form a germination floor, said frame means being adapted to be carried by a plurality of support beams,

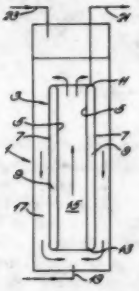
bolt means extending through said cross members and through the cross members of an adjacent frame means to attach said frame means in an end to end relation,

each of said frame means having a perforated tray sheet attached to said top of said frame means, said tray sheets of adjacent frame means having bent down edge portions being disposed between said cross members of adjacent frame means, said bolt means also extending through said edge portions of said bent down portion adjacent said frame means to secure said edge portions between said cross frame members of adjacent frame means.

4,943,535
ANTI-LIFT FERMENTER

Philip W. Thompson, and Lesley A. Wood, both of Slough, Great Britain, assignors to Celltech Limited, Slough, England

PCT No. PCT/GB86/00359, § 371 Date Apr. 6, 1987, § 102(e) Date Apr. 6, 1987, PCT Pub. No. WO86/07605, PCT Pub. Date Dec. 31, 1986
PCT Filed Jun. 20, 1986, Ser. No. 47,917
Claims priority, application United Kingdom, Jun. 20, 1985, 8515629
Int. Cl.[5] C12M 1/12
U.S. Cl. 435—311 6 Claims



1. A continuous air-lift fermenter vessel for receiving a suspension culture of cells, the vessel comprising:

air-lift means, in use for agitating a suspension culture received in the vessel and causing a gross flow movement of the suspension culture, an inlet for continuously supplying culture medium to the vessel, an outlet for removing culture supernatant, and a filter material between the outlet and the vessel to prevent removal of cells from the suspension culture wherein the filter material is located such that in use, the gross flow movement of the suspension culture inhibits clogging of the filter material by cells and/or cell debris, said the outlet comprising a conduit formed in a divider between a downcomer and a riser, the conduit communicating with the fermenter vessel via the filter material forming at least a part of the divider, the divider comprising a double-walled draught tube defining, between the double-walls, a conduit space communicating in use with the suspension culture through at least a portion of the draught tube comprising the filter material.

6. A continuous air-lift fermenter vessel for receiving a suspension culture of cells, said vessel comprising:

an inlet means for continuously supplying culture medium to said vessel;

a divider comprising a filter material and a double-walled draught tube having two concentric walls and a conduit space therebetween, said conduit space communicating with said vessel via said filter material;

a riser and a downcomer each having an upper and lower part and being separated from each other by said divider;

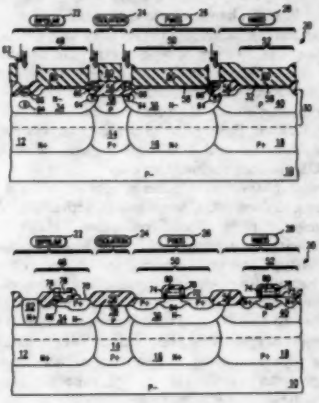
means for injecting a gas into said lower part of said riser for causing a gross flow movement of suspension culture in said vessel comprising an upward flow of suspension culture in said riser and a downward flow of suspension in said downcomer, said gross flow movement of suspension culture allowing culture supernatant to be drawn into said conduit space and inhibiting clogging of said filter material with cells from said suspension culture; and

outlet means for removing culture supernatant from said conduit space.

4,943,536
TRANSISTOR ISOLATION

Robert H. Havemann, Garland, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Filed May 31, 1988, Ser. No. 200,395
Int. Cl.[5] H01L 21/265, 21/76
U.S. Cl. 437—28 19 Claims



1. A method of manufacturing a semiconductor device in a substrate having semiconductor surface areas thereon, said method comprising the steps of:

forming a first well region of a first conductivity type in said substrate at one of said surface areas;

forming a second well region of a second conductivity type in said substrate at said one area, adjacent to said first well;

introducing a first dopant of said first conductivity type into said first and second well regions;

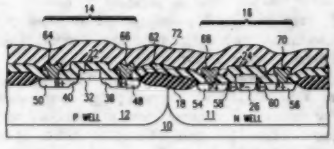
forming a field insulating region overlying first portions of said first and second well regions at said one area; and

introducing a second dopant of said second conductivity type through said field insulating region into said first portion of said second well region.

4,943,537
CMOS INTEGRATED CIRCUIT WITH REDUCED SUSCEPTIBILITY TO PMOS PUNCHTHROUGH

Thomas E. Harrington, III, Carrollton, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 210,242, Jun. 23, 1988, Pat. No. 4,906,588. This application Jun. 27, 1989, Ser. No. 372,077
Int. Cl.[5] H01L 21/265, 27/00
U.S. Cl. 437—34 19 Claims



1. A method for fabricating a CMOS integrated circuit, comprising the steps of:

a. providing a semiconductor body which includes monocrystalline semiconductor well regions near the surface thereof, first ones of said well regions being predominantly doped P-type, and second ones of said well regions

being predominantly doped N-type, isolation regions being disposed to prevent conduction between ones of said well regions;

b. forming an insulated gate electrode in a predetermined pattern over said semiconductor body, some portions of said insulated gate electrode extending over portions of said first well regions to define NMOS channel regions therein, and other portions of said insulated gate electrode extending over portions of said second well regions to define PMOS channel regions therein;

c. introducing donor dopants into both said first and second well regions, to form N-type lateral field isolation regions near the surface of said second well regions adjacent to said PMOS channel regions therein;

d. introducing donor dopants into said first well regions only, to form lightly-doped-drain-extension regions near the surface of said first well regions adjacent to said NMOS channel regions therein;

e. forming N-type source/drain regions in said first well regions, to form NMOS transistors with said NMOS channel regions, ones of said respective NMOS channel regions being separated from respectively adjacent ones of said N-type source/drain regions by respective ones of said lightly-doped-drain extension regions; and

f. forming P-type source/drain regions in said second well regions, to from PMOS transistors with said PMOS channel regions, ones of said respective PMOS channel regions being separated from respectively adjacent ones of said P-type source/drain regions by respective ones of said lateral field isolation regions;

wherein said step (c) is performed before said step (f), and said step (d) is performed before said step (e).

4,943,538

PROGRAMMABLE LOW IMPEDANCE ANTI-FUSE ELEMENT

Amr M. Mohsen, Saratoga; Esmat Z. Hamdy, Fremont, and John L. McCollum, Saratoga, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Division of Ser. No. 861,519, May 9, 1986. This application Mar. 10, 1988, Ser. No. 166,324

Int. Cl.[5] H01L *21/22, 21/465*

U.S. Cl. 437—52 **6 Claims**

1. A method for manufacturing a programmable low impedance anti-fuse element on a substrate in a CMOS fabrication process including the steps of:

defining and doping with a first conductivity type, a first region in said substrate for forming the lower electrode of said programmable low impedance anti-fuse element simultaneously with a definition and doping of the source and drain regions in said substrate,

removing the initial gate oxide layer in said first region,

forming a dielectric layer for said programmable low impedance circuit interconnect element over said region, said dielectric layer including a first silicon dioxide portion, a second silicon nitride portion over said silicon dioxide portion, and a third silicon dioxide portion over said second silicon nitride portion,

forming a conductive layer to form the upper electrode for said programmable low impedance circuit interconnect element over said dielectric layer,

defining said conductive layer and said dielectric layer,

continuing said CMOS process sequence.

4,943,539

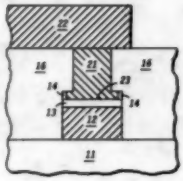
PROCESS FOR MAKING A MULTILAYER METALLIZATION STRUCTURE

Syd R. Wilson, Phoenix; James A. Sellers, and Robert J. Mattox, both of Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 9, 1989, Ser. No. 350,665

Int. Cl.[5] H01L *21/90*

U.S. Cl. 437—195 **10 Claims**



1. A method for increasing contact area of a via metallization formed between metal interconnect layers of a multi-layer metallization comprising the steps of: providing a first metal layer; forming a sacrificial layer on the first metal layer, wherein the first metal layer serves as an etch stop for the sacrificial layer; forming an interlayer dielectric covering the sacrificial layer; etching a via in the interlayer dielectric; isotropically etching the sacrificial layer to expose an area of the first metal layer so that the exposed area of the first metal layer is larger than the area of the via; forming the via metallization on the exposed first metal layer filling the via and a void created by the isotropic etching of the sacrificial layer.

4,943,540

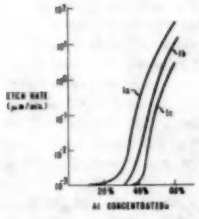
METHOD FOR SELECTIVELY WET ETCHING ALUMINUM GALLIUM ARSENIDE

Fan Ren, Dunellen Township, Middlesex County, and Nitin J. Shah, Scotch Plains, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 28, 1988, Ser. No. 290,774

Int. Cl.[5] H01L *21/00, 21/02, 21/208, 29/68*

U.S. Cl. 437—225 **14 Claims**



1. A method of manufacturing a semiconductor device, which includes etching AlGaAs on an wafer, CHARACTERIZED BY THE STEPS OF:

depositing a masking layer over the AlGaAs;

patterning the masking layer to expose regions of the AlGaAs to be etched;

cleaning the exposed AlGaAs regions with a solution of ammonium hydroxide (NH_4OH);

etching the AlGaAs regions with a solution of diluted hydrofluoric acid (HF) at a predetermined temperature or less;

wherein the predetermined temperature is approximately the boiling temperature of the diluted HF solution, the

concentration of HF 48% or less, and the concentration of aluminum in the AlGaAs is 60% or less.

4,943,541
GLASS CERAMICS

Akira Watanabe, Okayama; Yoshimitsu Takeuchi; Seiji Kihara, both of Bizen, and Makoto Mitsudo, Okayama, all of Japan, assignors to Kyushu Refractories Co., Ltd., Okayama, Japan

Continuation of Ser. No. 893,571, Aug. 5, 1986, abandoned. This application May 13, 1988, Ser. No. 195,446
Claims priority, application Japan, Aug. 7, 1985, 60-174694
The portion of the term of this patent subsequent to Dec. 2, 2003, has been disclaimed.
Int. Cl.[5] C03C 10/02
U.S. Cl. 501—10 2 Claims

1. A $CaO—Al_2O_3—P_2O_5$ glass ceramics consisting essentially of 0.01 to 25 parts by weight of alkaline oxides selected from the group consisting of Li_2O, Rb_2O, and Cs_2O, in a 100 parts by weight of the crystalline glass composed of 10 to 60 weight % of CaO, 5 to 25 weight % of Al_2O_3, and 25 to 85 weight % of P_2O_5.

4,943,542
PROCESS FOR PRODUCING SILICA GLASS

Fusashi Hayashi; Kooichi Takei; Yooichi Matii; Toshikatsu Simazaki, all of Tsukuba; Akihito Imai, and Takao Nakada, both of Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Oct. 26, 1988, Ser. No. 262,803
Claims priority, application Japan, Oct. 31, 1987, 62-276455; Oct. 31, 1987, 62-276457; Oct. 31, 1987, 62-276459; Nov. 20, 1987, 62-294459
Int. Cl.[5] C03C 3/06
U.S. Cl. 501—12 13 Claims

1. A process for producing a silica glass which comprises hydrolyzing at least one member selected from the group consisting of a silicon alkoxide of the formula:

$$Si(OR)_4$$

wherein R is an alkyl group, and a silicon alkoxide polycondensate of the formula:

$$(RO)_3Si\text{-}[OSi(OR)_2]_n\text{-}OSi(OR)_3$$

wherein R is an alkyl group; and n is zero or an integer of 1 to 8, to give a silica sol,

gelating the silica sol to give a silica gel,

drying the silica gel to give a dry gel, and

sintering the dry gel,

at least before the gelation, there being added to a hydrolyzing system at least one member selected from the group (A) including polyethylene glycols, polyethylene glycol ethers, hydroxyalkyl celluloses, and polyvinyl acetates.

4,943,543
SINTERED CERAMIC MATERIALS

Nils A. Ingelstrom, Bromma, Sweden, assignor to Sandvik Aktieboiag, Sandviken, Sweden

Continuation of Ser. No. 44,336, Apr. 30, 1987, abandoned. This application Dec. 7, 1988, Ser. No. 281,916
Int. Cl.[5] C04B 35/58, 35/10, 35/14
U.S. Cl. 501—96 16 Claims

1. Sintered ceramic material based on silicon nitride, silicon oxide, aluminum nitride, aluminum oxide or mixtures thereof, in which the densification during sintering takes place with an intergranular liquid phase, said material comprising a core and a surface zone with a gradual transition in at least one of composition and crystal structure between said core and said surface zone.

4,943,544
HIGH STRENGTH, ABRASION RESISTANT REFRACTORY CASTABLE

Charles N. McGarry, Clarksville, Ind.; Clarence W. J. Miller, Louisville, Ky., and Thomas M. Wehrenberg, Jeffersonville, Ind., assignors to Corhart Refractories Corporation, Louisville, Ky.

Filed Oct. 10, 1989, Ser. No. 420,672
Int. Cl.[5] C04B 35/10, 14/04, 14/30
U.S. Cl. 501—124 30 Claims

1. A refractory composition which consists essentially of by weight:

(a) 44 to 89 % of an abrasion-resistant refractory grain;

(b) 10 to 50 % of a hydraulic cement;

(c) 1 to 6 % of a filler consisting of very fine, substantially spherical particles of a material selected from the group consisting of Al_2O_3, Cr_2O_3, ZrO_2, TiO_2, clay minerals, carbon and fume SiO_2;

(d) 0.01 to 1%, based on the total weight of the constituents (a), (b) and (c), of additives selected from deflocculants and wetting agents.

4,943,545
ACTIVATION OF ZEOLITES

Clarence D. Chang, Princeton; Scott Han, and Bruce P. Pelrine, Lawrenceville, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 60,542, Jun. 11, 1987, abandoned, which is a continuation-in-part of Ser. No. 59,368, Jun. 8, 1987, abandoned. This application Oct. 14, 1988, Ser. No. 258,090
Int. Cl.[5] B01J 29/38, 29/08, 29/28, 37/26
U.S. Cl. 502—56 15 Claims

1. A method of activation a catalyst composition comprising a framework aluminum-deficient crystalline aluminosilicate zeolite containing non-framework aluminum which comprises

providing said aluminum-deficient zeolite, which as been deactivated by removal of aluminum from said framework, during exposure to at least one gas selected from the group consisting of oxygen and steam, under conditions effective to remove said aluminum from said framework

contacting said catalyst composition with a dilute aqueous fluoride solution of from about 0.001 to 0.1 N, wherein said solution is essentially free of zeolite framework substituting atoms at a temperature of about 20 to 100° C. for about 0.1 to 48 hours, wherein said fluoride solution is prepared from at least one fluoride reagent selected from the group consisting of, ammonium hydrogen fluoride and a mixture of ammonium fluoride and hydrogen fluoride converting said fluoride solution treated catalyst to its ammonium exchanged form, thereafter calcining said converted catalyst, wherein said catalyst composition treated by said method has been previously utilized in an organic compound conversion or contacted with steam, under conditions sufficient to deactivate said composition by removal of aluminum from said zeolite framework; and

recovering said zeolite which exhibits a hexane cracking activity greater than that of the aluminum-deficient zeolite.

4,943,546
NORMAL PARAFFIN ISOMERIZATION CATALYST COMPRISING A MORDENITE AND TITANIUM

Christine Travers, Rueil-Malmaison, and Jean-Pierre Franck, Bougival, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 3, 1988, Ser. No. 266,594
Claims priority, application France, Nov. 3, 1987, 87 15333
Int. Cl.[5] B01J 29/20
U.S. Cl. 502—66 7 Claims

1. A catalyst consisting of, by weight:

(a) 10–99.98 % of a mordenite adsorbing molecules of a kinetic diameter higher than about 6.6 Angstroms, having

a Si/Al atomic ratio from about 5 : 1 to 100: 1, a sodium content lower than 0.2 % by weight, in proportion to the total weight of dry mordenite, a mesh volume V of elementary mesh from 2.73 to 2.78 cubic nanometers, a benzene adsorption capacity higher than 5 % by weight in proportion to the dry mordenite weight, said mordenite being in major part shaped as needles,

(b) 0–89.98 % of a matrix selected from the group formed of alumina, silica, magnesia, natural clays, mixtures of these compounds and alumina-boron oxide combinations,

(c) 0.01–15 % of at least one group VIII metal, and

(d) 0.01–1 % of titanium.

4,943,547

METHOD OF PRESULFIDING A HYDROTREATING CATALYST

James D. Seamans, 1 Cormac Ct., Reisterstown, Md. 21136; James G. Welch, 107 Fireside Cir., Baltimore, Md. 21212, and Neal G. Gasser, 508 Windy Knoll Dr., Mt. Airy, Md. 21771

Filed Sep. 13, 1988, Ser. No. 243,687

Int. Cl.[5] B01J *27/051, 27/049, 27/047;* **K10G** *45/08*

U.S. Cl. 502—150 **18 Claims**

1. A method of presulfiding a hydrotreating metal oxide catalyst comprising the steps of:

(a) contacting said catalyst with powdered elemental sulfur at a temperature below the melting point of sulfur such that said elemental sulfur sublimes and is substantially incorporated in the pores of said catalyst, thereby forming a mixture, and

(b) heating said mixture in the presence of hydrogen to a temperature above the melting point of sulfur and below 390° F. for a timer period long enough for substantially all of the sulfur incorporated into the catalyst pores to have reacted to produce metal sulfides and hydrogen sulfides and to achieve a final sulfur level sufficient to sulfide active and promot metal in said catalyst.

18. A mixture comprising a metal oxide catalyst and a suspension, wherein said suspension comprises:

an amount of elemental sulfur sufficient to sulfide active and promoter metals in said catalyst upon exposure to hydrogen; and

an amount of a hydrocarbon solvent or high boiling oil which can be substantially incorporated into said catalyst.

4,943,548

METHOD OF PREPARING A CATALYST FOR THE HYDROCONVERSION OF ASPHALTENE-CONTAINING HYDROCARBONACEOUS CHARGE STOCKS

John G. Gatsis, Des Plaines, Ill., assignor to UOP, Des Plaines, Ill.

Filed Jun. 24, 1988, Ser. No. 210,943

Int. Cl.[5] B01J *31/00*

U.S. Cl. 502—173 **16 Claims**

1. A method for the preparation of a catalyst which method comprises the following steps:

(a) adding to an asphaltene-containing hydrocarbonaceous oil charge stock an oil-insoluble metal compound and a low molecular weight alcohol;

(b) converting said oil-insoluble metal compound within said charge stock by heating said oil to a temperature from about 120° F. (43° C.) to about 450° F. (232° C.) to produce an organometallic compound within said charge stock; and

(c) converting said organometallic compound within said charge stock by reacting under hydroconversion conditions including a temperature from about 650° F. (343° C.) to about 1000° F. (538° C.), a hydrogen partial pressure from about 500 psig (3448 kPa gauge) to about 5000 psig (36480 KPa gauge) and a space velocity from about 0.1 to about 10 volumes of oil feed per hour per volume of reactor to produce said catalyst.

4,943,549

SUPPORTED RUTHENIUM CATALYST, ITS PREPARATION AND ITS USE IN THE PREPARATION OF OPTIONALLY SUBSTITUTED CYCLOHEXYLAMINE AND OPTIONALLY SUBSTITUTED DICYCLOHEXYLAMINE

Otto Immel; Hans-Helmut Schwarz, and Reinhard Thiel, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 6, 1989, Ser. No. 376,109

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1988, 3824822

Int. Cl.[5] B01J *23/10, 23/34, 23/46*

U.S. Cl. 502—304 **9 Claims**

1. A ruthenium catalyst which is useful in the hydrogenation of anilines to cyclohexylamines and dicyclohexylamines wherein said catalyst is supported on Al_2O_3 and wherein said Al_2O_3 support contains at least one rare earth metal and manganese and said catalyst having a ruthenium content of 0.05–5% by weight, relative to the total weight of catalyst.

4,943,550

CATALYSTS FOR OXIDATION OF CARBON MONOXIDE

John H. Kolts, Ochelata; Scott H. Brown, Bartlesville, and Patricia A. Tooley, Bartlesville, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 14, 1989, Ser. No. 366,946

Int. Cl.[5] B01J *21/04, 21/10, 23/89*

U.S. Cl. 502—327 **20 Claims**

1. In a process for preparing a composition of matter comprising (a) a support material selected from the group consisting of alumina, magnesium aluminate and mixtures thereof, (b) platinum metal, and (c) an iron component selected from the group consisting of iron oxides, iron metal and mixtures thereof, wherein said composition of matter has undergone a reducing treatment, the improvement which comprises:

(1) treating said composition of matter, which has undergone a reducing treatment, with an acidic liquid;

(2) heating the material obtained in step (1) under such conditions as to substantially remove said acidic liquid from said material obtained in step (1); and

(3) treating the material obtained in step (2) with a reducing gas under such conditions as to enhance the activity of said material for catalyzing the reaction of carbon monoxide with free oxygen to carbon dioxide.

4,943,551

CATALYST FOR SYNTHESIS OF MIXTURES OF METHANOL AND HIGHER ALCOHOLS

Bernard D. Dombek, Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Company, Inc., Danbury, Conn.

Filed Nov. 8, 1985, Ser. No. 796,411

Int. Cl.[5] B01J *21/06, 23/04, 23/12, 23/72*

U.S. Cl. 502—345 **7 Claims**

1. Catalyst composition for the production of methanol and higher saturated aliphatic alcohols from synthesis gas consisting essentially of:

(i) about 0.18 to about 0.81 mol fraction of copper;

(ii) about 0.045 to about 0.54 mol fraction of thorium;

(iii) up to about 0.54 mol fraction of zirconium; and

(iv) about 0.01 to about 0.2 mol fraction of an alkali metal.

4,943,552

PROCESS FOR PREPARING A GAS ABSORBENT

Yutaka Osajima; Katsumi Yamamura, both of Fukuoka, and Yoshio Unno, Nagoya, all of Japan, assignors to Honshu Seishi Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1986, Ser. No. 864,468
Claims priority, application Japan, May 20, 1985, 60-107914
Int. Cl.[5] D01J *20/20, 20/04*
U.S. Cl. 502—417 16 Claims

1. A gas absorbent, prepared by adding sodium bromate to a mixture of sulfuric acid aqueous solution and active carbon, reacting them, separating solids from the reaction mixture, and drying said solids.

4,943,553

METHOD OF MAKING ETHYLBIPHENYLS

Kathuhiko Sakura, Tokyo; Genki Takeuchi, Kitakyushu, and Naoko Takeshita, Yukuhashi, all of Japan, assignors to Nippon Steel Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 210,964, Jun. 24, 1988, abandoned.
This application Nov. 2, 1989, Ser. No. 432,416
Int. Cl.[5] C07C *15/12*
U.S. Cl. 585—471 16 Claims

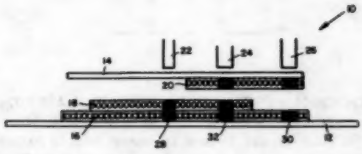
1. A method of making ethylbiphenyls which comprises the step of reacting a mixture consisting essentially of polyethylbenzenes with a reactant consisting essentially of biphenyl in the presence of a solid acid catalyst which is at least one member selected from the group consisting silica-alumina and Y zeolite.

4,943,554

CARBONLESS COPYING SYSTEM AND METHOD OF PRODUCING MULTIPLE COLORED COPY IMAGES THEREWITH

Norman Macaulay, Tonawanda, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed May 24, 1988, Ser. No. 198,070
Int. Cl.[5] B41M *5/22*
U.S. Cl. 503—201 12 Claims



9. A method of producing copy images having a plurality of different colors, comprising

applying a first image-forming component to a recording substrate;

applying at least one of a plurality of complementary image-forming components to a selected portion of a transfer substrate, each of said plurality of complementary image-forming components being encapsulated in microcapsules and being capable of forming a different colored reaction product when reacting with said first image-forming component;

applying at least one other of said plurality of complementary image-forming components to a selected portion of said recording substrate over said first image-forming component;

positioning said recording substrate and said transfer substrate whereby said first and said plurality of complementary image-forming components are arranged in juxtaposed contact with one another;

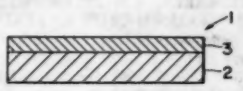
applying pressure to selected locations of said transfer substrate to rupture the microcapsules of at least one of said plurality of complementary image-forming components whereby said component comes into contact with said first image-forming component on said recording substrate to form selected colored reaction products on the corresponding locations on said recording substrate.

4,943,555

IMAGE-RECEIVING SHEET

Mitsuharu Nakamoto; Kazuhiko Sano, and Takashi Kawazawa, all of Kyoto, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Nov. 1, 1988, Ser. No. 265,502
Claims priority, application Japan, Apr. 21, 1987, 62-98214
Int. Cl.[5] B41M *5/18*
U.S. Cl. 503—227 3 Claims



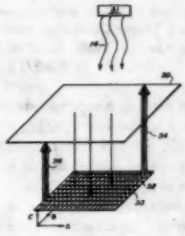
1. An image-receiving sheet which is used in combination with a heat transfer sheet having a dye layer containing a dye transferable through melting or sublimiation with heat, said image-receiving sheet having a receiving layer for receiving the dye transferred from said heat transfer sheet on one surface of a sheet substrate, said receiving layer comprising a synthetic resin and the weight of the solvent in said receiving layer being 0.75% or less of the weight of the solvent soluble components forming the receiving layer.

4,943,556

SUPERCONDUCTING NEURAL NETWORK COMPUTER AND SENSOR ARRAY

Harold H. Szu, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 30, 1988, Ser. No. 252,486
Int. Cl.[5] G06C *7/00*
U.S. Cl. 505—1 7 Claims



1. A parallel processing computer apparatus formed by an array of triodes comprising:

a first group of N parallel filaments of a opto-electric light sensitive material, where N is an integer from 1 to 10,000, wherein each filament carries a current flow;

a second group of M parallel filaments of a opto-electric light sensitive material, where M is an integer from 1 to 10,000, wherein each filament carries a current flow and is positioned perpendicular to and under a filament from the first group of filaments, in physical but not electric contact with the filaments from the said first group of filaments, collectively forming an array of M×N triodes at filament crossing nodes;

a light-supplying control means above the array for focusing particular intensities of light in a fixed pattern to points

perpendicular to the filaments of the first group of parallel filaments just beyond the individual nodes such that the light impinges only on filaments of the first group of parallel filaments and not on the second group of parallel filaments;

a means of receiving output signals from one group of filaments and feeding the signals into the light-supplying control means to adjust the pattern of the light, thereby providing iterative convergence toward a solution matrix based on the initialization and the input.

4,943,557

METHOD OF MAKING A HIGH DENSITY YBA CU_3O_x SUPERCONDUCTOR MATERIAL

Hung C. Ling, Belle Mead, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 15, 1988, Ser. No. 232,418

Int. Cl.[5] C01B *13/00*; C01F *17/00*; C01G *3/02*; C04B *35/00*

U.S. Cl. 505—1 **5 Claims**

1. A method of making a superconductor composition of $YBa_2Cu_3O_x$ comprising the steps of: mixing together a compound of yttrium, barium carbonate, and a compound of copper selected from the group consisting of cupric carbonate and cupric oxalate; calcining the mixture by heating it to a temperature of 850 to 950 degrees C.; milling the calcined material; pressing the milled and calcined material to a solid structure; sintering the solid structure in an oxygen-containing atmosphere at a temperature of 960 to 990 degrees C. for at least two hours; annealing the sintered structure at 400 to 600 degrees C. for a period of time from two hours to two days, thereby to obtain a structure of $YBa_2Cu_3O_x$ which has a density of a least 90 .

4,943,558

PREPARATION OF SUPERCONDUCTING OXIDE FILMS USING A PRE-OXYGEN NITROGEN ANNEAL

Richard E. Soltis, Redford; Eleftherios M. Logothetis, Birmingham, and Mohammad Aslam, Farmington Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 15, 1988, Ser. No. 182,261

Int. Cl.[5] B05D *5/12*

U.S. Cl. 505—1 **11 Claims**

1. A method of making a superconducting metal oxide film on a substrate, said method comprising:

depositing a thin film of a superconducting metal oxide precursor consisting essentially of R, Ba, Cu, and O onto said substrate in a thickness between about 0.1 and 3 μm to form a film/substrate composite, wherein R is selected from the group consisting of rare earth elements and yttrium, which precursor film can be annealed in an oxygen atmosphere to yield a superconducting metal oxide film;

then heating said film/substrate composite to a first temperature between about 400° and 950° C. in less than about 10 seconds;

then maintaining said composite at said first temperature in an oxygen free nitrogen atmosphere between about 5 and

then bringing said film/substrate composite to a second temperature between about 800° C. and 950° in an oxygen atmosphere in less than about 10 seconds;

then maintaining said film/substrate composite at said temperature in the oxygen atmosphere for between about 5 and 30 seconds to anneal said film; and

then cooling said film/substrate composite to less than 300° C. in less than about 3 minutes.

4,943,559

DEVICE COMPRISING A TEMPERATURE SENSOR

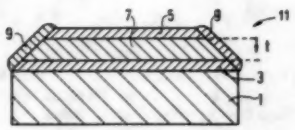
Jan W. Severin, and Gijsbertus De With, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1989, Ser. No. 316,394

Claims priority, application Netherlands, Mar. 7, 1988, 8800556

Int. Cl.[5] G10K *7/00*; G01N *25/20*

U.S. Cl. 505—1 **3 Claims**



1. A device comprising a sensor (11) for producing a temperature dependent electric signal wherein the sensor (11) comprises a thin layer of a material (7), the composition of which layer (7) varies gradually over the layer thickness, provided on a substrate (1), which layer is superconductive below a critical temperature the value of which depends on the composition of the material, and which layer is connected electrically by means of electrodes (9) to an electronic circuit for supplying current to the sensor and processing the signal produced by the sensor and wherein said electronic circuit comprises a current course (21) as well as a measuring circuit (23) for measuring the electric voltage between the sensor electrodes (9) and for supplying a control signal to a heating circuit which comprises a heating element (25) which is accommodated together with the sensor (11) in a cooled space (13) and which heats said cooled space (13) when supplied with said electric current, which control signal ensures that an electric current is supplied to the heating element when the measured voltage is equal to zero and that the heating element is switched off when the measured voltage exceed zero.

4,943,560

SOLVENT SYSTEM FOR CHRONIC VASCULAR INFUSION OF HYDROPHOBIC DRUGS

Bruce D. Wigness, and Thomas D. Rohde, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 6, 1988, Ser. No. 178,139

Int. Cl.[5] A61K *37/00, 31/045*

U.S. Cl. 514—11 **3 Claims**

1. A liquid infusate for the chronic vascular infusion of a hydrophobic biologically-active compound comprising a solution of therapeutically-effective amount of a cyclosporin in a solvent consisting essentially of about 10–80% glycerol and about 90–20% ethanol, by volume.

4,943,561

GASTRIN RELEASING PEPTIDE ANTAGONIST

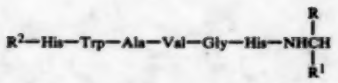
David C. Heimbrook, Ringoes, N.J.; Mark W. Riemen, Doylestown, Pa.; Allen Oliff, Gwynedd Valley, Pa., and Walfred S. Saari, Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 28, 1988, Ser. No. 276,985

Int. Cl.[5] A61K *37/02*; C07K *7/06*

U.S. Cl. 514—17 **8 Claims**

1. A compound having the formula



wherein R^2 is alkylacyl, alkylsulfonyl or alkoxy carbonyl, R and R^1 are the same or independently an alkyl or alkenyl group of from 1 to 8 carbon atoms, or an aryl alkyl group, wherein the alkyl, alkenyl and aromatic groups are optionally substituted with alkyl of from 1 to 3 carbon atoms, wherein the carbon containing R and R^1 is in either the R or S configuration and wherein any one optically active amino acid may be substituted by its D-isomer, or glycine may be substituted by Ala or D-Ala.

4,943,562

TETRA- AND PENTAPEPTIDES CONTAINING THE LYSYL-ARGINYL-ASPARTYL SEQUENCE AND THEIR APPLICATIONS AS MEDICINES, PARTICULARLY ANTI-THROMBOTIC MEDICINES

Pierre Jolles, Paris; Anne-Marie Fiat, Le Vesinet; Claudine Soria, Taverny; Levy-Toledano Sylviane, Paris, all of France; Sanghamitra Raha, Calcutta, India; Elisabeth Mazoyer, Paris, and Ludovic Drouet, Bourg-la-Reine, both of France, assignors to Institut des Vaisseaux et du Sang and Centre National de la Recherche Scientifique, both of Paris, France

Filed Oct. 28, 1988, Ser. No. 263,859

Claims priority, application France, Oct. 30, 1987, 87 15061

Int. Cl.[5] A61K *37/02*; C07K *7/06*

U.S. Cl. 514—18 **14 Claims**

1. A peptide of the formula I:

Z-Lys-Arg-Asp-X-Y (I)

wherein:

X is the residue of an amino acid in the L-configuration selected from the group consisting of Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp and Tyr,

Y is hydroxyl or the C-terminal residue of an amino acid in the L-configuration selected from the group consisting of Ala, Arg, Asn, Asp, Cys, Gln, Glu, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr and Val,

Z is acetyl, hydrogen or the N-terminal residue of an amino acid in the L-configuration selected from the group consisting of Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr and Val, N-acetylated or not N-acetylated;

with the provisos that:

when Y is the C-terminal residue of an amino acid in the L-configuration, Z is acetyl or hydrogen, and

X can in all cases be different from Y and from Z.

4,943,563

2,3,4-TRIACYLHEXOSE INSECT REPELLANTS

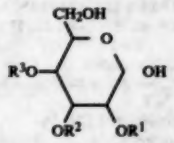
Martha A. Mutschler, and John C. Steffens, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,769

Int. Cl.[5] A01N *43/00*

U.S. Cl. 514—23 **22 Claims**

1. A method of repelling insects from the surfaces of a plant which comprises applying thereto an insect repellent amount of a 2,3,4-tri-O-acylhexose of the formula:



wherein the hexose is a hexose selected from the group composed of glucose, mannose, galactose, allose, altrose, gulose, idose, and talose;

the anomeric (C-1) substituent is either alpha or beta; and

R^1, R^2, and R^3 are each acyl groups derived from fatty acids containing from about 3 to about 30 carbon atoms;

in combination with an inert solid or liquid carrier.

4,943,564

INTRAARTERIAL INJECTION PHARMACEUTICALS OF 5-FLUORO-2'-DEOXYURIDINE ESTERS

Masahiro Nakano; Shoji Fukushima, both of Kumamoto; Takeo Kawaguchi, and Yoshiki Suzuki, both of Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP86/00071, § 371 Date Oct. 16, 1986, § 102(e) Date Oct. 16, 1986, PCT Pub. No. WO86/04816, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 17, 1986, Ser. No. 928,226

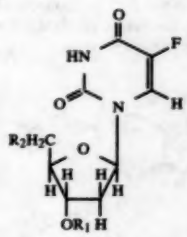
Claims priority, application Japan, Feb. 18, 1985, 60-28431

Int. Cl.[5] A61K *31/70*

U.S. Cl. 514—50 **3 Claims**

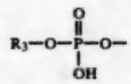
1. A pharmaceutical composition for intraarterial administration comprising:

(a) at least one 5-fluoro-2'-deoxyuridine ester represented by formula



(I)

wherein R, represents a C_8–C_{12} alkyl acyl group and R_2 represents a C_8–C_{12} alkyl acyloxy group or



in which R_3 represents a C_5–C_{26} alkyl group, or a pharmaceutically acceptable salt thereof, and

(b) at least one oleaginous base.

4,943,565

ANALGESIC TABLET OF ASPIRIN AND CAFFEINE CONTAINING LOW-SUBSTITUTED HYDROXYPROPYL CELLULOSE

Thomas M. Tencza, Wallington, and Chung-Bin Kim, Livingston, both of N.J., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Continuation of Ser. No. 132,717, Dec. 11, 1987, abandoned, which is a continuation of Ser. No. 907,697, Sep. 15, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 282,983

Int. Cl.[5] **A61K** *31/16, 31/52, 31/62*

U.S. Cl. 514—161 **10 Claims**

1. In a tablet containing by weight of the tablet about 22–75% aspirin, about 22–75% acetaminophen and about 4–19% caffeine, said tablet dissolving in a predetermined period of time, the improvement comprising incorporating into said tablet a dissolution enhancing amount of a hydroxypropyl cellulose ether nonionic polymer which has a hydroxypropyl content of from about 10% to about 16% by weight of the polymer, whereby said polymer-containing tablet dissolves in less than said predetermined period of time.

4,943,566

NOVEL 17-ARYL-STEROIDS

Lucien Nedelec, Le Raincy; Francois Nique, Pavillons-Sous-Bois; Daniel Philibert, La Varenne Saint-Hilaire; Martine Moguilewsky, and Marie-Madeleine Bouton, both of Paris, all of France, assignors to Roussel Uclafi

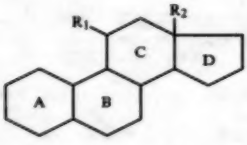
Filed Jul. 28, 1988, Ser. No. 225,305

Claims priority, application France, Jul. 30, 1987, 87 10794

Int. Cl.[5] **A61K** *31/56, 31/58;* **C07J** *1/00, 71/00*

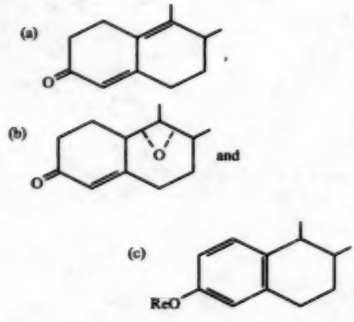
U.S. Cl. 514—179 **15 Claims**

1. A compound selected from the group consisting of compounds of the formula

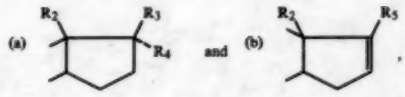


I

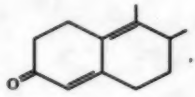
wherein R_1 is an organo of 1 to 18 carbon atoms optionally containing at least one heteroatom connected to the C ring by a carbon atom, R_2 is methyl or ethyl, the A and B rings are selected from the group consisting of



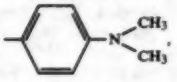
Re is selected from the group consisting of hydrogen, optionally substituted alkyl of 1 to 6 carbon atoms and acyl and the D ring is selected from the group consisting of



one of R_3 and R_4 is selected from the group consisting of hydroxy, protected hydroxy, acyl and alkoxy and the other is an optionally substituted aryl, R_5 is an optionally substituted aryl and their non-toxic, pharmaceutically acceptable salts with acids and bases with the proviso that when the A and B rings are



R_1 is



R_2 is methyl, R_3 is —OH and R_4 is phenyl.

4,943,567

CEPHALOSPORIN COMPOUND AND PHARMACEUTICAL COMPOSITION THEREOF

Susumu Nishizawa, Kyoto; Hiroyuki Muro, Higashiazai; Masayasu Kasai; Satoru Hatano, both of Kameoka; Syouzi Kamiya, Kyoto; Nobuharu Kakeya, Nagaokakyo, and Kazuhiko Kitao, Kyoto, all of Japan, assignors to Kyoto Pharmaceutical Industries, Ltd., Kyoto, Japan

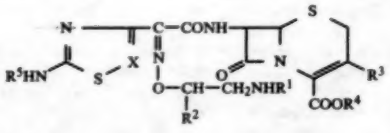
Filed May 27, 1988, Ser. No. 228,714

Claims priority, application Japan, May 30, 1987, 62-136647

Int. Cl.[5] **A61K** *31/545;* **C07D** *501/20*

U.S. Cl. 514—203 **15 Claims**

1. A Cephalosporin compound represented by formula (I):



(I)

wherein R^1 and R^5 independently represent a hydrogen atom or an amino-protective group; R^2 represents a lower alkyl group or a cycloalkyl group with from 3 to 6 ring members; R^3 represents a hydrogen atom, a lower alkenyl group, a lower alkanoyloxymethyl group, a carbamoyloxymethyl group, a heterocyclic thiomethyl group or a heterocyclic methyl group; R^4 represents a hydrogen atom or an ester residue; a X represents CH or a nitrogen atom; each heterocyclic group is a 5- or 6-membered heterocyclic group; each hetero ring member is a nitrogen atom, a sulfur atom or an oxygen atom, each heterocyclic group has from 1 to 4 ring nitrogen atoms and is optionally substituted, and any substituent of a heterocyclic group is a member selected from the group consisting of an oxo group, a lower alkyl group, $—(CH_2)_xR^a$ (wherein R^a is a hydroxyl group, methoxy group, a carbamoyl group, a carboxyl group, a dimethylamino group, a sulfonic acid group, or an unsubstituted heterocyclic group, as previously defined, an x is an integer from 0 to 2), $—(CH_2)_2—$ and $—(CH_2)_3—$; or a pharmacologically-acceptable addition salt thereof.

15. A method of treating a host afflicted with a bacterial infection caused by Gram-positive bacteria, Gram-negative bacteria or Pseudomonas bacteria, which comprises administering to the host an effective amount of compound of claim 1 or of a pharmacologically acceptable addition salt thereof.

4,943,568

CEPHALOSPORINS

Michael Boberg; Rolf Angerbauer; Karl G. Metzger, all of Wuppertal, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

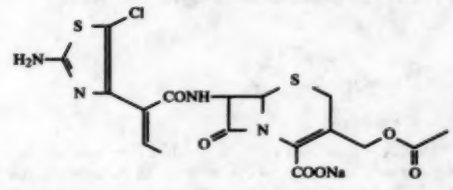
Filed Nov. 21, 1986, Ser. No. 933,729

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, 3541095

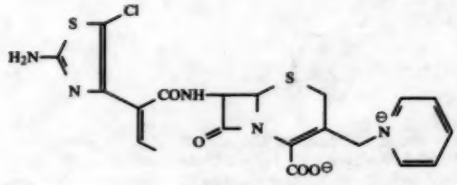
Int. Cl.[5] C07D 501/46; A61K 31/545

U.S. Cl. 514—206 **6 Claims**

1. A compound selected from the group consisting of sodium Z-7-[2-(2-amino-5-chlorothiazol-4-yl)but-2-enoyl]-amino-3-acetoxymethyl-3-cephem-4-carboxylate of the formula



and Z-7-[2-(2-amino-5-chlorothiazol-4-yl)but-2-enoyl]-amino-3-pyridinium-methyl-3-cephem-4-carboxylate of the formula



4,943,569

B-LACTAM COMPOUNDS

Makoto Sunagawa, Osaka, Japan, assignor to Sumitomo Pharmaceuticals Co., Ltd., Osaka, Japan

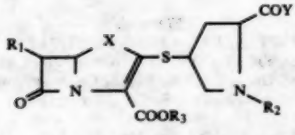
Continuation of Ser. No. 608,618, May 9, 1984, abandoned. This application Oct. 8, 1987, Ser. No. 106,036

Claims priority, application Japan, May 9, 1983, 58-081443; Jun. 15, 1983, 58-108472; Jul. 12, 1983, 58-127485; Sep. 9, 1983, 58-166938; Nov. 11, 1983, 58-212857; Feb. 10, 1984, 59-023497

Int. Cl.[5] C07D 487/04; A61K 31/40

U.S. Cl. 514—210 **39 Claims**

1. A β-lactam compound represented by the formula:



wherein R_1 represents a 1-hydroxyethyl group or a 1-hydroxyethyl group in which the hydroxy group is protected with a protecting group for a hydroxy group; R_2 represents a hydrogen atom or a protecting group for an amino group; R_3 represents a hydrogen atom or a protecting group for a carboxyl group; X represents an unsubstituted methylene group and Y represents a group of the formula (2):

(2)

wherein R_5 and R_6, which may be the same or different, each represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 3 to 4 carbon atoms, an aralkyl group having 1 to 3 carbon atoms in the alkyl moiety thereof, a substituted alkyl group having 1 to 4 carbon atoms wherein said substituent is selected from the group consisting of hydroxyl, di-(C_1–C_3)-alkylamino or carbamoyl, or R_5 and R_6 are taken together to represent an alkylene chain or an alkylene chain via an oxygen atom, a sulfur atom or a (C_1–C_3)alkyl-substituted nitrogen atom to form, together with the adjacent nitrogen atom, a 4- to 7-membered cyclic amino group, and a pharmaceutically acceptable salt thereof.

4,943,570

BENZIMIDAZOLESULFONAMIDES AND IMIDAZOPYRIDINESULFONAMIDES, AND THEIR APPLICATION AS DRUGS

Jordi F. Constanso; Juan P. Coromines, and Augusto C. Pinol, all of Barcelone, Spain, assignors to Laboratorios Del Dr. Esteve, S.A., Spain

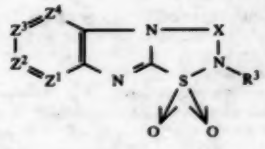
Division of Ser. No. 38,874, Apr. 15, 1987. This application Apr. 28, 1989, Ser. No. 344,966

Claims priority, application France, Apr. 21, 1986, 8605721

Int. Cl.[5] A61K 31/54, 31/55; C07D 417/14, 513/04

U.S. Cl. 514—222.8 **4 Claims**

1. A compound corresponding to the general formula Ib:



Ib

in which:

Z^1 represents a nitrogen atom or a carbon atom bonded to another radical R^4 (C—R^4);

Z^2 represents a nitrogen atom or a carbon atom bonded to another radical R^5 (C—R^5);

Z^3 represents a nitrogen atom or a carbon atom bonded to another radical R^6 (C—R^6);

Z^4 represents a nitrogen atom or a carbon atom bonded to another radical R^7 (C—R^7);

with the restriction that only one of the groups Z^1, Z^2, Z^3, or Z^4 can represent a nitrogen atom;

R^3 represents a radical selected from the group consisting of a hydrogen atom, a linear or branched alkyl radical, an aryl radical, a heteroaryl radical, an alkylaryl radical, an alkylheteroaryl radical, a mono-, bi- or tri- cycloalkyl radical, an alkylamino radical, an N,N-dialkyl-alkylamino radical, an N-alkyl-alkylamino radical, an alkylcarboxyalkyl radical, an acyl radical, an alkylthioalkyl radical, an alkylsulfinylalkyl radical, an alkylsulfonylalkyl radical, an alkylthioaryl radical, an alkylsulfinylaryl radical, an alkylsulfonylaryl radical, an alkylthioheteroaryl radical, an alkylsulfinylheteroaryl radical, an alkylsulfonylheteroaryl radical, an alkylthioalkylaryl radical, an alkylsulfinylalkylaryl radical, an alkylsulfonylalkylaryl radical, an alkylthioalkylheteroaryl radical, an alkylsulfinylalkylheteroaryl radical, an alkylsulfonylalkylheteroaryl radical, a haloalkyl radical, a cyanoalkyl radical, an N-alkylaryl-alkylamino radical, an N-alkyl-N-alkylaryl-alkylamino radical, a hydroxyalkyl radical, an alkylpiperazinyl radi-

cal, an alkylpiperidinyl radical, and an alkylmorpholinyl radical;

R^4 and R^7 independently represent a hydrogen atom, a halogen atom, a nitro radical, an amino radical or an acylamino radical;

R^5 and R^6 independently represent a radical selected from the group consisting of a hydrogen atom, a halogen atom, an amino radical, a nitro radical, a lower alkyl radical, a trifluoromethyl radical, an alkoxy radical, an aryloxy radical, a mercapto radical, an alkylthio radical, an alkylsulfonyl radical, an alkylsulfonyl radical, a sulfamoyl radical, an isothiocyanate radical, an alkylcarbonyl radical, an arylcarbonyl radical, an acylamino radical, a cyano radical, a carboxyl group, a carboxamido group, and a carboxyalkyl group wherein the alkyl group in said alkyl and alkyl-containing radical is a C_1–C_6 alkyl group, and said acyl radical is a C_1–C_6 group; wherein said aryl radical is a C_6–C_{12} carbocyclic aromatic radical; and said heteroaryl radical is a single five- to six-membered heterocyclic ring selected from the group consisting of pyridyl, isoxazolyl and morpholino radicals; with the provisos that:

(a) when R^1, R^2, R^4, R^5, R^6 and R^7 are hydrogen, R^3 is not a radical selected from the group consisting of hydrogen, phenyl, m-chlorophenyl, m-tolyl, methyl, ethyl, and n-propyl;

(b) when R^1, R^4, R^5, R^6 and R^7 are hydrogen, R^3 is not phenyl when R^2 is methyl or carboxyethyl, R^3 is not methyl when R^2 is methyl, and R^2 and R^3 do not form a morpholine ring; and

(c) when R^1, R^4, R^6 and R^7 are hydrogen and R^5 is methyl, R^3 is not phenyl when R^2 is hydrogen, and R^2 and R^3 do not form a morpholine ring;

X represents $—(CHR^8)_n—(CHR^9)_m—$ or $—CR^8=CR^9—$;

n represents 1, 2, 3 or 4;

m represents 0 or 1 with the proviso that if n = 1, m is not 0; and

R^8 and R^9 independently represent a hydrogen atom, a lower alkyl radical, an aryl radical or a heteroaryl radical wherein the alkyl group in said alkyl and alkyl-containing radical is a C_1–C_6 group.

4. A method of treating a patient having a gastrointestinal disease which comprises administering to said patient an effective amount of a compound of the formula of claim 3 or a physiologically acceptable salt thereof.

4,943,571

AMINOALKYLTHIODIBENZOXEPINS AND PHARMACEUTICAL USE

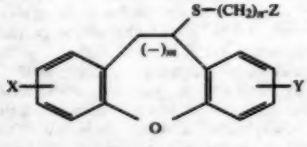
Helen H. Ong, Whippany; Vernon B. Anderson, High Bridge, both of N.J., and James A. Profitt, Goshen, Ind., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 738,507, May 28, 1985, Pat. No. 4,837,227, which is a continuation of Ser. No. 330,257, Dec. 14, 1981, abandoned, which is a continuation-in-part of Ser. No. 226,045, Jan. 19, 1981, abandoned, which is a continuation of Ser. No. 29,462, Apr. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 860,083, Dec. 13, 1977, abandoned. This application Apr. 10, 1989, Ser. No. 335,354

Int. Cl.[5] H61K *31/35, 31/585;* **C07D** *311/80, 413/12*

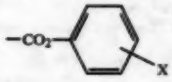
U.S. Cl. 514—232.8 **39 Claims**

1. A compound of the formula

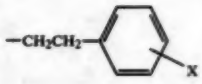


wherein X and Y are the same or different and each can be hydrogen, halogen, trifluoromethyl, loweralkoxy, loweralkyl, loweralkylthio, loweralkylsulfonyl, loweralkylsulfinyl, amino, or nitro; Z is

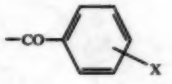
R^1 is hydrogen, straight or branched chain loweralkyl, cyano, cycloalkylloweralkyl wherein the cycloalkyl ring contains from 3 to 6 carbon atoms, phenoxycarbonyl of the formula



where X is defined as above, alkoxycarbonyl, loweralkenyl or loweralkynyl; R^2 is straight or branched chain loweralkyl or cycloalkylloweralkyl wherein the cycloalkyl ring contains from 3 to 6 carbon atoms, phenylethyl of the formula



wherein X is defined as above, loweralkenyl or loweralkynyl; and where R^1 and R^2 are taken together with the nitrogen atom to which they are attached, the group $R^1—N—R^2$ forms a heterocycle which is morpholino, piperidino, 4-substituted piperidino in which the 4-substituent is benzoyl of the formula



wherein X is defined as above, pyrrolidinyl, piperazinyl or N-substituted piperazinyl in which the N-substituent is loweralkyl; m is the integer 0; and n is an integer of from 2 to 4; and physiologically tolerable acid addition salts thereof.

32. A method of treating depression which comprises administering to a patient a pharmaceutically effective amount of a compound defined in claim 1.

33. A method of treating pain which comprises administering to a patient a pharmaceutically effective amount of a compound defined in claim 1.

34. A method of treating convulsions which comprises administering to a patient a pharmaceutically effective amount of a compound defined in claim 1.

4,943,572

1-CARBAMOYLALKYL-2-PHENYLINDOLES, PHARMACEUTICAL COMPOSITIONS AND USE

Erwin von Angerer, Grasslfing, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

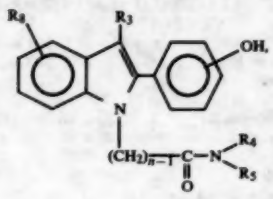
Filed Jun. 23, 1989, Ser. No. 370,509

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1988, 3821148

Int. Cl.[5] A61K *31/405, 31/535;* **C07D** *209/12, 295/192*

U.S. Cl. 514—235.2 **6 Claims**

1. 1-Carbamoylalkyl-2-phenylindoles of formula IIIb



(III b)

4,943,574
(1H-AZOL-1-YLMETHYL) SUBSTITUTED BENZOTRIAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

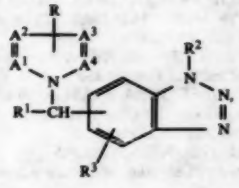
Alfons H. M. Raeymaekers, Beerse; Eddy J. E. Freyne, Rumst; Josephu L. H. Van Gelder, Kasterlee, all of Belgium, and Marc G. Venet, Paris, France, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation of Ser. No. 223,486, Jul. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 194,775, May 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 56,021, Jun. 1, 1987, abandoned. This application Sep. 28, 1989, Ser. No. 415,440

Int. Cl.[5] A61K *31/44, 31/41;* C07D *401/14, 401/02*

U.S. Cl. 514—338 11 Claims

1. A compound of the formula:



(I)

a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof, wherein:

$-A^1=A^2-A^3=A^4-$ is a bivalent group of the formula:

$-CH=N-CH=CH-$ (a-1),

$-CH=N-CH=N-$ (a-2), or

$-CH=N-N=CH-$ (a-3);

R is hydrogen or C_{1-6}alkyl;

R^1 is hydrogen, C_{1-6}alkyl optionally substituted with phenyl or substituted phenyl, phenyl, substituted phenyl, C_{3-7}cycloalkyl, pyridinyl, naphthalenyl, thienyl, furanyl, imidazolyl, triazolyl, C_{2-6}alkenyl, or C_{2-6}alkynyl;

R^2 is hydrogen; C_{1-6}alkyl optionally substituted with phenyl, substituted phenyl, C_{3-7}cycloalkyl, naphthalenyl, hydroxy, or C_{1-4}alkyloxy; phenyl; substituted phenyl; C_{2-6}alkenyl; C_{2-6}alkynyl; C_{3-7}cycloalkyl; bicyclo[2.2.1]heptan-2-yl; 2,3-dihydro-1H-indenyl, 1,2,3,4-tetrahydronaphthalenyl; hydroxy; C_{2-6}alkenyloxy optionally substituted with phenyl or substituted phenyl; C_{2-6}alkynyloxy; di(phenyl)methoxy; or C_{1-6}alkyloxy optionally substituted with halo, hydroxy, amino, mono- and di(C_{1-4}alkyl)amino, trifluoromethyl, carboxyl, C_{1-6}alkyloxycarbonyl, phenyl, substituted phenyl, phenoxy, phenylthio, C_{3-7}cycloalkyl, or (1,1'-biphenyl)-4-yl; and

R^3 is hydrogen or nitro,

wherein substituted phenyl is phenyl substituted with up to three substituents each independently selected from halo, hydroxy, hydroxymethyl, trifluoromethyl, C_{1-6}alkyl, C_{1-6}alkoxy, C_{1-6}alkyloxycarbonyl, carboxyl, formyl, (hydroxyimino)-methyl, nitrile, amino, mono- and di(C_{1-6}alkyl)amino, and nitro.

4,943,573
IMIDAZO[4,5-B]QUINOLINYLOXYALKANOIC ACID AMIDES WITH ENHANCED WATER SOLUBILITY

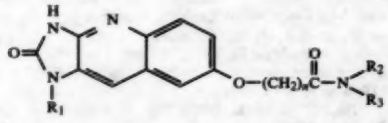
Nicholas A. Meanwell, East Hamptom, Conn., assignor to Bristol-Myers Squibb Company, New York, N.Y.

Filed Nov. 1, 1989, Ser. No. 430,228

Int. Cl.[5] A61K *31/495, 31/505, 31/445;* C07D *401/14, 471/04*

U.S. Cl. 514—253 37 Claims

1. A compound of the formula



wherein

n is 3 to 5;

R_1 is alkyl of 1 to 4 carbon atoms;

R_2 is hydrogen:

R_3 is 1-piperidinylethyl, 1-benzylpiperidin-4-yl, 4-(1-piperidinyl)piperidine, (1-alkyl-2pyrrolidinyl)alkyl where alkyl is 1 to 4 carbon atoms, 3-quinuclidinyl:

R_2 and R_3 together with the nitrogen atom to which they are attached form 4-R_4-piperazin-1-yl wherein

R_4 is alkyl of 1 to 7 carbon atoms, alkoxyethyl of 3 to 7 carbon atoms, pyridinyl, pyrimidinyl, tetrahydropyranylmethyl, thienylmethyl, cycloalkyl(CH_2)$_m$ where m is zero or one and cycloalkyl is 5 to 7 carbon atoms except m is zero when cycloalkyl is 7 carbon atoms, benzyl, 4-fluorobenzyl, 3-trifluoromethylbenzyl, 4-alkoxybenzyl where alkoxy is 1 to 4 carbon atoms:

or a pharmaceutically acceptable salt thereof.

32. A method for inhibiting cyclic AMP phosphodiesterase in a mammal which comprises administering a therapeutically effective amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof.

33. A method for increasing heart inotropic activity which comprises administering to a warm blooded animal, in need of such treatment a therapeutically effective amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof.

35. A method for inhibiting blood platelet aggregation in a mammal which comprises administering a therapeutically effective amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof.

4,943,575

PHARMACEUTICAL COMPOSITION FOR THE TREATMENT OF GENETICALLY CAUSED DEGENERATIVE RETINA DISEASES AND A PROCESS FOR THE PREPARATION THEREOF

Gertrud Cremer, Münster, Fed. Rep. of Germany, assignor to Pharm-Allergan GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Feb. 12, 1988, Ser. No. 155,400

Claims priority, application European Pat. Off., Feb. 13, 1987, 87102094.7

Int. Cl.[5] A61K *31/50*

U.S. Cl. 514—249 7 Claims

1. A method for treatment of retinopathia pigmentosa comprising administering a therapeutically effective amount of a pteridine to a subject afflicted with retinopathia pigmentosa.

4,943,576

SUBSTITUTED QUINOXALYL-IMIDAZOLIDINE-2,4-DIONES, PROCESSES FOR THEIR PREPARATION, THEIR USE AS MEDICAMENTS AND PHARMACEUTICAL PREPARATIONS

Heiner Glombik, Hofheim am Taunus; Roland Utz, Messel; Hans-Jochen Lang, Hofheim am Taunus; Karl Geisen, Frankfurt am Main, and Friedrich E. Beyhl, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

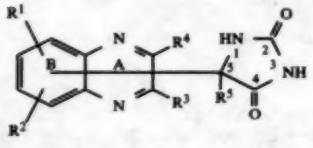
Filed Apr. 22, 1988, Ser. No. 184,965

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1987, 3713872

Int. Cl.[5] A61K *31/495*; C07D *401/02, 401/04, 401/14*

U.S. Cl. 514—249 5 Claims

1. A 5-quinoxalyl-imidazolidine-2,4-dione of the formula I



I

in which

the quinoxaline ring system is bonded to the imidazolidinedione via position 2',3',5',6',7' or 8',

R^1 R^2 are identical or different and are hydrogen, (C_1–C_6)-alkyl, (C_3–C_7)-cycloalkyl, phenyl-(C_1–C_4)-alkyl, naphthyl-(C_1–C_4)-alkyl, naphthyl, biphenyl, phenyl, pyridyl, furyl, thienyl, benzofuryl, (C_1–C_4)-alkoxy, halogen, halogeno-(C_1C_4)-alkyl, nitro, amino or hydroxyl;

R^3 and R^4 are identical or different and are hydrogen (C_1–C_4)-alkyl, (C_3–C_7)-cycloalkyl, phenyl-(C_1–C_4)-alkyl, naphthyl-(C_1–C_4)-alkyl, naphthyl, biphenyl, phenyl, pyridyl, furyl, thienyl, benzofuryl, (C_1–C_4)-alkoxy, halogen, halogeno-(C_1C_4)-alkyl, nitro, amino or hydroxyl;

R^5 is a hydrogen atom, (C_1–C_6)-alkyl, (C_3–C_7)-cycloalkyl, phenyl-(C_1–C_4)-alkyl, naphthyl-(C_1–C_4)-alkyl, naphthyl, biphenyl or phenyl,

with the exception of the compound wherein at the same time R^1, and R^2 and R^5 are each hydrogen, R^3 and R^4 are each methyl, and the quinoxaline ring system is bonded to the imidazolidinedione via position 6;

or a physiologically tolerated salt thereof.

4,943,577

PIPERAZINYLALKYLPIPERAZINEDIONE COMPOUNDS

Gilbert Lavielle, La Celle St-Cloud, and Jean C. Poignant, Bures S/Yvette, both of France, assignors to Adir Et Cie, Neuilly-sur-Seine, France

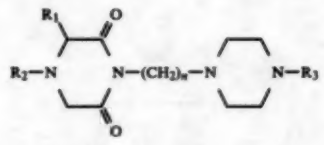
Division of Ser. No. 206,512, Jun. 14, 1988, Pat. No. 4,877,788. This application Jul. 19, 1989, Ser. No. 382,252

Claims priority, application France, Jun. 15, 1987, 87 08263

Int. Cl.[5] C07D *471/22*; A61K *31/495, 31/505*

U.S. Cl. 514—250 5 Claims

1. A compound selected from those of formula I:



(I)

in which

R_1 and R_2 form together and with the piperazine-2,6-dione radical to which they are attached a hexahydropyrazino-β-carbolinedione radical,

R_3 denotes pyrimidinyl radical or a phenyl radical optionally substituted by an alkyl radical of 1 to 4 carbon atoms or a trifluoromethyl radical,

n is an integer of 2 to 4, inclusive, and addition salts thereof with a pharmaceutically acceptable inorganic or organic acid.

4,943,578

PIPERAZINE COMPOUNDS

Alan Naylor; Duncan B. Judd, both of Ware, and Dearg S. Brown, Middlesex, all of England, assignors to Glaxo Group Limited, London, United Kingdom

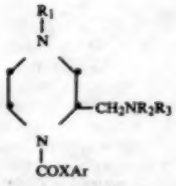
Filed May 23, 1989, Ser. No. 355,335

Claims priority, application United Kingdom, May 23, 1988, 8812179; Sep. 5, 1988, 8820845

Int. Cl.[5] A61K *31/495*; C07D *401/06, 403/06*

U.S. Cl. 514—252 10 Claims

1. A compound of formula (I)



(I)

wherein

R_1 represents —COR_4, —CO_2R_4 or —$COCO_2R_4$ (where R_4 represents a hydrogen atom or a C_{1-6} alkyl or c_{2-6} alkenyl group;

R_2 and R_3 are the same or different and are C_{1-6} alkyl or C_{3-6} alkenyl; or —NR_2R_3 forms a 5-membered (optionally containing an oxygen atom adjacent to the nitrogen) or 6-membered ring, which ring optionally contains one unit of unsaturation and which is unsubstituted or substituted by methylidene optionally substituted by a group selected from nitrile, phenyl, carboxyl, amido, C_{1-6} alkyl, phen(C_{1-6})alkyl, C_{1-6} hydroxyalkyl, C_{1-6} carboxyalkyl and C_{1-6} amidoalkyl, —COR_5 (where R_5 represents C_{1-6} alkyl, —OR_6 or —NHR_6 and R_6 represents hydrogen, C_{1-6} alkyl, phenyl, or phen(C_{1-6})alkyl or =NOR_7 (where R_7 represents C_{1-6} alkyl);

X represents a direct bond, —CH_2—or —CH_2O—;

Ar represents a phenyl moity substituted by one or more groups or atoms selected from halogen atoms, C_{1-6} alkyl, $-CF_3$ and NO_2 groups, or by two substituents which form a second ring; or a physiologically acceptable salt thereof.

7. A compound selected from

4-Acetyl-1-[(3,4-dichlorophenyl)acetyl]-2-(1-pyrrolidinylmethyl)piperazine;

1-[(3,4-Dichlorophenyl)acetyl]-4-(1-oxo-2-propenyl)-2-(1-pyrrolidinylmethyl)piperazine;

1-[(3,4-Dichlorophenyl)acetyl]-4-(1-oxopropyl)-2-(1-pyrrolidinylmethyl)piperazine;

4-Acetyl-1-[(3,4-dichlorophenyl)acetyl]-2-(1,2,3,6-tetrahydro-1-pyridinylmethyl)piperazine;

Ethyl 4-[(3,4-dichlorophenyl)acetyl]-3-(1-pyrrolidinylmethyl)-1-piperazinecarboxylate;

Methyl 4-[(3,4-dichlorophenyl)acetyl]-3-(1,2,3,6-tetrahydro-1-pyridinylmethyl)-1-piperazinecarboxylate;

or a physiologically acceptable salt thereof.

8. Methyl 4-[(3,4-dichlorophenyl)acetyl]-3-(1-pyrrolidinylmethyl)-1-piperazinecarboxylate or a physiologically acceptable salt thereof.

4,943,579

WATER SOLUBLE PRODRUGS OF CAMPTOTHECIN

B. Rao Vishnuvajjala, Rockville, Md., and Aaron Garzon-Aburbeh, St. Louis Park, Minn., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

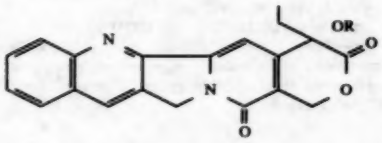
Filed Oct. 6, 1987, Ser. No. 104,894

Int. Cl.[5] A61K *31/47*; C07D *491/22*

U.S. Cl. 514—283 **3 Claims**

1. A compound of the formula:

(3)



wherein R is selected from the group consisting of:

R=CO CH_2 NH_2.HCl

R=CO CH_2NHCH_3.HCl

R=CO $CH_2NHC_2H_5$.HCl

R=CO CH_2 $N(C_2H_5)_2$.HCl

R=CO $CH(NH_2)$ $CH_2CH_2CH_2CH_2CH_2NH_2$.2HCl

R=CO $CH(NH_2)$ CH_2CH_2COOH. HCl

R=CO $CH_2CH2.COO^-$ Na^+.

3. A method of treating cancers which can be treated by administering camptothecin comprising administering to a patient with cancer an aqueous solution of a compound of claim 1 in sufficient quantity to provide from about 5 to about 10.0 mg/kg of body weight of camptothecin.

4,943,580

ANTI-HISTAMINIC BENZIMIDAZOLE, IMIDAZOPYRIDINE AND PURINE DERIVATIVES

Frans E. Janssens, Bonheiden; Gaston S. M. Diels, Ravels; Joseph L. G. Torremans, Beerse, and Francois M. Sommen, Wortel, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

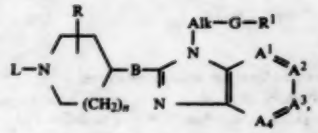
Continuation of Ser. No. 155,465, Feb. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 23,739, Mar. 9, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 307,712

Int. Cl.[5] A61K *31/44*; C07D *471/04*

U.S. Cl. 514—303 **14 Claims**

1. A compound of the formula:

(I)



a pharmaceutically acceptable acid addition salt or a stereochemically isomeric form thereof.

wherein:

$-A^1=A^2-A^3=A^4-$ represents a bivalent radical of the formula:

$-CH=CH-CH=CH-$ (a-1),

$-N=CH-CH=CH-$ (a-2),

$-CH=N-CH=CH-$ (a-3),

$-CH=CH-N=CH-$ (a-4),

$-CH=CH-CH=N-$ (a-5),

$-N=CH-N=CH-$ (a-6), or

$-CH=N-CH=N-$ (a-7);

wherein one or two hydrogen atoms in said radicals (a-1)-(a-7) may, each independently from each other, be replaced by halo, C_{1-6}alkyl, C_{1-6}alkyloxy, trifluoromethyl, or hydroxy;

R^1 represents hydrogen; C_{2-6}alkenyl optionally substituted with Ar^2, C_{3-6}alkynyl, Ar^1, or C_{1-6}alkyl optionally substituted with Ar^1, hydroxy; C_{1-6}alkyloxy; carboxyl; C_{1-6}alkyloxycarbonyl; Ar^2-oxycarbonyl; or Ar^2-C_{1-6}alkyloxycarbonyl;

wherein Ar^1 represents a member selected from the group consisting of phenyl being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, C_{1-6}alkyl, C_{1-6}alkyloxy, C_{1-4}alkylthio, mercapto, amino, mono- and di-(C_{1-6}alkyl)amino, carboxyl, C_{1-6}alkyloxycarbonyl, and C_{1-6}alkylcarbonyl; thienyl; halothienyl; furanyl; C_{1-6}alkyl-substituted furanyl; pyridinyl; pyrimidinyl; pyrazinyl; thiazolyl; and imidazolyl optionally substituted with C_{1-6}alkyl, and

wherein Ar^2 represents a member selected from the group consisting of phenyl being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, C_{1-6}alkyl, C_{1-6}alkyloxy, C_{1-6}alkylthio, mercapto, amino, mono- and di(C_{1-6}alkyl)amino, carboxyl, C_{1-6}alkyloxycarbonyl, and C_{1-6}alkylcarbonyl;

G represents O, S, or NR^2, wherein R^2 represents hydrogen, C_{1-6}alkyl, C_{1-6}alkylcarbonyl, C_{1-6}alkyloxycarbonyl, or Ar^2-C_{1-6}alkyl wherein Ar^2 is as defined above;

B represents NR^3, CH_2, O, S, SO, or SO_2, wherein R^3 represents hydrogen, C_{1-6}alkyl, C_{3-6}cycloalkyl, C_{1-6}alkylcarbonyl, C_{1-6}alkyloxycarbonyl, or Ar^2-C_{1-6}alkyl wherein Ar^2 is as defined above;

R represents hydrogen or C_{1-6}alkyl;

n represents a number having a value of 0, 1, or 2;

Alk represents C_{1-6}alkanediyl; and

L represents hydrogen, C_{1-6}alkylcarbonyl, C_{1-6}alkylsulfonyl, C_{1-6}alkyloxycarbonyl, Ar^2-C_{1-6}alkyloxycarbonyl, Ar^2-carbonyl, Ar^2-sulfonyl, C_{3-6}cycloalkyl, C_{2-6}alkenyl optionally substituted with Ar^2 wherein each said Ar^2 is as defined above, C_{1-12}alkyl, or a radical of the formula:

$-Alk-R^4$ (b-1);

$-Alk-Y-R^5$ (b-2);

—Alk—Z^1—(C=X)—Z^2—R^6 (b-3); or

—CH_2—CHOH—CH_2—O—R^7 (b-4),

wherein:

each Alk independently is as defined above;

R^4 represents Ar^2, Het, cyano, isocyanato, isothiocyanato, Ar^2-sulfonyl, or halo, wherein Ar^2 is as defined above;

R^5 represents hydrogen, Ar^2, Het, or C_{1-6}alkyl optionally substituted with halo, Ar^2, or Het, wherein Ar^2 is as defined above;

R^6 represents hydrogen, Ar^2, Het, or C_{1-6}alkyl optionally substituted with halo, Ar^2, or Het, wherein Ar^2 is as defined above;

R^7 represents Ar^2 or naphthalenyl wherein Ar^2 is as defined above;

Y represents O, S, or NR^8, wherein R^8 represents hydrogen, C_{1-6}alkyl, C_{1-6}alkylcarbonyl, or Ar^1-carbonyl wherein Ar^1 is as defined above;

Z^1 and Z^2 each independently represent O, S, NR^9, or a direct bond, wherein R^9 represents hydrogen or C_{1-6}alkyl; and

X represents O, S, or NR^{10}, wherein R^{10} represents hydrogen, C_{1-6}alkyl, or cyano,

wherein Het represents:

(i) an optionally substituted five- or six-membered heterocyclic ring containing 1, 2, 3, or 4 heteroatoms selected from the group consisting of oxygen, sulfur, and nitrogen, provided that no more than two oxygens or sulfurs are present; or

(ii) an optionally substituted five- or six-membered heterocyclic ring containing 1 or 2 heteroatoms selected from the group consisting of oxygen, sulfur, and nitrogen, being ortho-condensed with an optionally substituted five- or six-membered ring through two ring carbon atoms or one ring carbon and one ring nitrogen atom, containing in the remainder of the condensed ring only carbon atoms; or

(iii) an optionally substituted five- or six-membered heterocyclic ring containing 1 or 2 heteroatoms selected from the group consisting of oxygen, sulfur, and nitrogen, being ortho-condensed with an optionally substituted five- or six-membered heterocyclic ring through two ring carbon atoms or one ring carbon and one ring nitrogen atom, containing in the remainder of the condensed ring 1 or 2 heteroatoms selected from the group consisting of oxygen, sulfur, and nitrogen,

when said Het represents a monocyclic ring system it may optionally be substituted with up to 3 substituents, and when said Het represents a bicyclic ring system it may be substituted with up to 6 substituents, wherein said substituents of Het are selected from the group consisting of a bivalent radical of the formula =X wherein X is as defined above, or a monovalent radical selected from the group consisting of halo, isocyanato, isothiocyanato, nitro, cyano, trifluoromethyl, a radical of the formula —A, a radical of the formula —Y—A, and a radical of the formula —Z^1—C(=X)—Z^2—A, wherein each A independently represents hydrogen, Ar^2, or C_{1-6}alkyl being optionally substituted with Ar^2, C_{1-6}alkoxy, Ar^2—O, hydroxy, or C_{1-6}alkyloxycarbonyl wherein Ar^2 is as defined above, and Y, Z^1, and Z^2 each independently are as defined above, provided that when in the radical —Z^1—C(=X)—Z^2—A, A represents hydrogen and Z^1 represents NR^9, O, or S, then Z^2 is other than O or S,

provided that when (i) L is hydrogen, C_{1-6}alkyl, or benzyl, and (ii) R^1—G—Alk is C_{1-6}alkyloxyethyl, C_{2-6}alkenyloxyethyl, C_{3-6}alkynyloxyethyl, or phenoxyethyl, then —A^1=A^2—A^3=A^4— is other than a bivalent radical of formula (a-1).

4,943,581

ISOQUINOLINESULFONAMIDES

Hiroyoshi Hidaka, 799-75 Kannonjicho; Toshio Tanaka, both of Tsushi; Yasuo Itoh, Katsuyamashi; Hideo Kato, Fukuishi; Eiichi Koshinaka, Katsuyamashi; Kazuya Mitani, Fukuishi, and Shunichiro Sakurai, Katsuyamashi, all of Japan, assignors to Hokuriku Pharmaceutical Co., Ltd., Katsuyamashi and Hiroyoshi Hidaka, Tsushi Mie, both of, Japan

Filed Jun. 26, 1989, Ser. No. 371,392

Claims priority, application Japan, Jul. 4, 1988, 63-165050

Int. Cl.[5] A61K *31/47;* **C07D** *217/22*

U.S. Cl. 514—307 **4 Claims**

1. An isoquinolinesulfonamide selected from: the compound N-(2-aminoethyl)-5-chloroisoquinoline-8-sulfonamide and pharmacologically-acceptable acid addition salts thereof.

4. A method for the treatment of a subject afflicted with a circulatory ailment, comprising the step of administering to the said subject an amount of a compound of claim 1 which is effective for alleviation of said ailment.

4,943,582

ACTIVE COMPOUNDS

John M. Evans; Geoffrey Stemp; Gordon Burrell, and Frederick Cassidy, all of Harlow, England, assignors to Beecham Group p.l.c., England

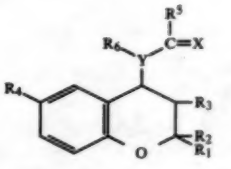
Filed May 1, 1987, Ser. No. 45,626

Claims priority, application United Kingdom, May 3, 1986, 8610911; Oct. 3, 1986, 8623768

Int. Cl.[5] A61K *31/40, 31/35;* **C07D** *405/04*

U.S. Cl. 514—320 **9 Claims**

1. A compound of formula (I) or, when the compound of formula (I) contains a salifiable group, a pharmaceutically acceptable salt thereof:



(I)

wherein:

Y is N;

one of R_1 and R_2 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_1 and R_2 together are C_{2-5}-polymethylene;

R_3 is hydrogen, hydroxy, C_{1-6} alkoxy or C_{1-7} unsubstituted carboxylic acyloxy;

R_4 is a C_{3-8} cycloalkyl group, a C_{1-6} alkyl group or a C_{1-6} alkyl group substituted by amino;

R_5 and R_6 together are —CH_2—$(CH_2)_n$—Z—$(CH_2)_m$— wherein m and n are 0 to 2 such that m+n is 1 or 2 and Z is CH_2;

X is oxygen or sulphur; and

the nitrogen-containing group in the 4-position being trans to the R_3 group when R_3 is hydroxy, C_{1-6} alkoxy or C_{1-7} acyloxy.

9. A method of treatment of hypertension in mammals which comprises the administration to the mammal in need of such treatment, an antihypertensive effective amount of a compound according to claim 1.

4,943,583

HETEROCYCLIC COMPOUNDS

Christoph Lüthy, Schwerzenbach, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

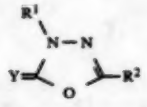
Filed Dec. 1, 1987, Ser. No. 126,804

Claims priority, application Switzerland, Dec. 1, 1986, 4785/86; Sep. 16, 1987, 3571/87

Int. Cl.[5] C07D *271/113*; A01N *43/82*

U.S. Cl. 514—364 **9 Claims**

1. Compounds of the formula



I

wherein

R^1 is phenyl, pyridyl, phenyl substituted with up to 5 substituents selected from the group consisting of halo, C_{1-4} alkyl, halomethyl, C_{1-3}-alkoxy, C_{1-2}-alkylthio, C_{1-3}-haloalkoxy, C_{1-2}-haloalkylthio and cyano, of which no more than 4 are halo, 3 are alkyl, 2 are halomethyl or 1 is alkoxy, alkylthio, haloalkoxy, haloalkylthio or cyano, or pyridyl substituted with 1 or 2 halogen atoms, 1 or 2 methyl groups or a halomethyl group;

R^2 is phenyl substituted with up to 3 substituents selected from the group consisting of halo, methyl, halomethyl and methoxy, of which no more than 2 are methoxy or 1 is methyl or halomethyl, with at least one of the two o-positions being occupied;

Y is oxygen or sulfur; and

R^3 is methyl, halomethyl or 2-propynyl.

4,943,584

(P-PHENOXYPHENOXY)-METHYL-FIVE-MEMBERED HETARYLS

Hans Theobald, Limburgerhof; Christoph Kuenast, Otterstadt; Peter Hofmeister, Neustadt; Hans-Juergen Neubauer, Mannheim; Thomas Kuekenhoehner, Frankenthal; Wolfgang Krieg, Weingarten; Joachim Leyendecker, Mannheim, and Uwe Kardorff, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

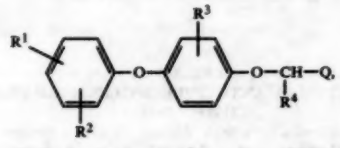
Filed Apr. 20, 1988, Ser. No. 184,122

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1987, 3713337; Feb. 8, 1988, 3803703

Int. Cl.[5] A01N *43/80, 43/76*; C07D *261/08, 261/12*

U.S. Cl. 514—380 **6 Claims**

1. (p-Phenoxyphenoxy)-methyl-five-membered hetaryls of the formula I



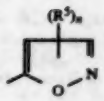
(I)

where the substituents have the following meanings:

R^1, R^2, R^3 hydrogen, halogen, C_1–C_8-alkyl, C_1–C_8-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, C_3–C_{10}-cycloalkyl, nitro or cyano,

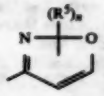
R^4 hydrogen or C_1–C_4-alkyl,

Q a five-membered hetaryl radical of the formulae II.31 to II.33



(II.31)

(II.32)



(II.33)

where

R^5 is halogen, C_1–C_8-alkyl, C_2–C_8-alkenyl, C_1–C_4-haloalkyl, C_1–C_8-alkoxy, C_2–C_8-alkoxyalkyl, C_3–C_{10}-cycloalkyl, phenyl or C_7–C_{20}-phenylalkyl, the phenyl and C_7–C_{20}-phenylalkyl being unsubstituted or monosubstituted, disubstituted or trisubstituted in the aryl moiety by halogen, C_1–C_8-alkyl, C_1–C_8-alkoxy, C_1–C_4-haloalkyl or C_1–C_4-haloalkoxy or cyano or monosubstituted or disubstituted by nitro, and

n is 0, 1, 2 or 3.

4,943,585

N-SUBSTITUTED AZOLES AND INSECTICIDE, ARACHNICIDE, AND NEMATOCIDE COMPOSITIONS THEREOF

Rainer Boerstinghaus, Telgte; Hans-Juergen Neubauer, Mannheim; Peter Hofmeister, Neustadt; Christoph Kuenast, Otterstadt; Joachim Leyendecker, Mannheim, and Uwe Kardorff, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

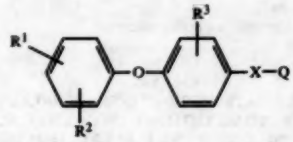
Filed Apr. 22, 1988, Ser. No. 184,804

Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714709; Jan. 23, 1988, 3801919

Int. Cl.[5] C07D *233/74, 233/54, 233/56*; A01N *43/50*

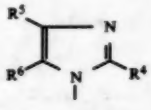
U.S. Cl. 514—398 **3 Claims**

1. An N-substituted azole of the formula I:



(I)

where R^1, R^2 and R^3 are each hydrogen, halogen, C_1–C_8-alkyl, C_1–C_8-alkoxy, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, C_3–C_{10}-cycloalkyl, nitro or cyano, Q is an unsubstituted or substituted azole group of the formula:



(IIa)

wherein R^4, R^5 and R^6 are hydrogen, halogen, C_1–C_8-alkyl, C_1–C_4-haloalkyl, C_1–C_4-alkoxy, C_3–C_{10}-cycloalkyl or hydrocarbyl aryl which is unsubstituted or mono-, di- or trisubstituted by halogen, C_1–C_8-alkyl, C_1–C_8-alkoxy, C_1–C_4-haloalkyl

or C_1–C_4-haloalkoxy, and X is $—O(CH_2)_n—$, and n is an integer from 1–3.

2. An insecticide, arachnicide or nematocide composition, comprising an insectidically, arachnicidally or nematocidally effective amount of the N-substituted azole of claim 1 and an insectidically, arachnicidally or nematocidally acceptable carrier.

4,943,586

PYRAZOLE-CONTAINING JUVENILE HORMONE MIMICS FOR PEST CONTROL, COMPOSITIONS AND USE

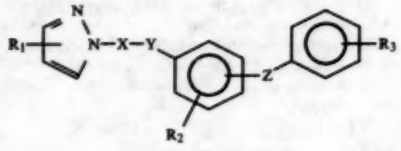
William S. Bowers, Tucson, Ariz., and Takeyoshi Sugiyama, Sendai, Japan, assignors to Arizona Board of Regents for the University of Arizona, Tucson, Ariz.

Filed Dec. 14, 1988, Ser. No. 284,394

Int. Cl.[5] **A01N** *43/56*; **C07D** *231/12, 405/06*

U.S. Cl. 514—406 **17 Claims**

1. A compound having pesticidal activity and which has the following general formula:



wherein:

R_1 is selected from hydrogen, C_{1-6} alkyl, halogen, C_{1-6} alkoxy, C_{2-6} alkoxycarbonyl, amino, nitro, CF_3, and C_{1-5}-(alkyl and dialkyl)-amino;

X is a divalent hydrocarbon radical having 1 to 8 carbon atoms in its backbone, which may be interrupted by 1 or 2 of O or S, and which may be substituted by 1 or OH groups, CF_3 groups halogens, C_{1-4} alkyl groups or C_{1-4} alkoxy groups;

Y is O, S, SO, or SO_2;

Z is O, S, SO, or SO_2;

R_2 is selected from hydrogen, halogen, C_{1-6} alkyl, C_{1-6} alkoxy and C_{2-6} alkoxycarbonyl; and

R_3 is selected from hydrogen, halogen, C_{1-6} alkyl, C_{1-6} alkoxy and C_{2-6} alkoxycarbonyl.

10. A composition having pesticidal activity containing the compound of claim 1

in combination with a carrier material.

4,943,587

HYDROXAMATE DERIVATIVES OF SELECTED NONSTEROIDAL ANTIINFLAMMATORY ACYL RESIDUES AND THEIR USE FOR CYCLOOXYGENASE AND 5-LIPOXYGENASE INHIBITION

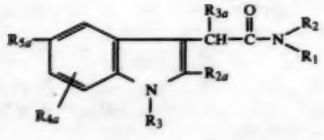
Wlaczeslaw A. Cetenko; David T. Connor; Daniel L. Flynn, and Jagadish C. Sircar, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 19, 1988, Ser. No. 196,584

Int. Cl.[5] **C07D** *209/28, 413/02, 403/02*; **A61K** *31/405*

U.S. Cl. 514—415 **11 Claims**

1. A compound of the formula (Ia)



Ia

and pharmaceutically acceptable cid addition or base salt thereof in which

(i) R_1 is hydrogen, lower alkyl or acyl;

(ii) R_2 is H, lower alkyl, cycloalkyl of from three to twelve carbon atoms of which from three to seven carbons are ring carbons, aryl arylalkyl or heteroaryl with the overall proviso that R_1 and R_2 cannot both be hydrogen; and

(iii) R_3 is hydrogen, phenylmethyl, allyl, vinyl, isopropenyl or

in which

R_{1a} is selected from the group consisting of benzene, naphthalene, biphenyl and substituted benzene, naphthalene and biphenyl radicals in which said substituent is selected from the group consisting of halogen, lower alkyl, lower alkylthio, lower alkoxy, trifluoromethyl, phenoxy, lower alkyl phenoxy, lower alkoxy phenoxy, halogenophenoxy, trifluoroacetyl, difluoroacetyl, monofluoroacetyl, di-lower alkyl sulfamyl, lower alkanyl, di-lower alkyl carboxamido, cyano, carb-lower alkoxy, trifluoromethylthio, lower alkyl sulfinyl, lower alkylsulfonyl, benzylthio, lower alkylbenzylthio, lower alkoxybenzylthio, halogenobenzylthio, mercapto, nitro, amino, di-(lower alkyl)amino, lower alkylamino, lower alkanoylamino, hydroxy, lower alkanoyloxy, trifluoroacetoxy, difluoroacetoxy, monofluoroacetoxy, benzyloxy, lower alkylbenzyloxy, lower alkoxybenzyloxy, and halogenobenzyloxy;

R_{2a} is selected from the group consisting of hydrogen, lower alkenyl and lower alkyl;

R_{3a} is selected from the group consisting of hydrogen and lower alkyl;

R_{4a} is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, fluorine and trifluoromethyl;

R_{5a} is selected from the group consisting of hydrogen, hydroxy, lower alkyl, lower alkoxy, nitro, amino, lower alkylamino, di(lower alkyl) amino, lower alkanoylamino, lower alkanoyl, lower alkylamino, bis(hydroxy lower alkyl)amino, 1-pyrrolidino, 4-methyl-1-piperazinyl, 4-morpholinyl, cyano, amino lower alkyl, mono-lower alkylamino lower alkyl, di-lower alkyl amino lower alkyl, trifluoromethyl, halogen, di(lower alkyl)sulfamyl, benzylthio, lower alkylbenzylthio, lower alkoxybenzylthio, halogenobenzylthio, benzyloxy, lower alkylbenzyloxy, lower alkoxybenzyloxy, halogenobenzyloxy, lower alkenyl, lower alkenyloxy, 1-azacyclopropyl, cyclopropyl (lower alkoxy) methoxy, and cyclobutyl(lower alkoxy) methoxy.

11. A method of treating a condition advantageously affected by inhibtion of 5-lipoxygenase and cyclooxygenase in a human suffering therefrom comprising administering a compound of the formula Ia of claim 1 in unit dosage form.

4,943,588

PRODRUGS OF ANTIHYPERCHOLESTEROLEMIC COMPOUNDS

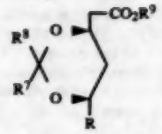
Wasyl Halczenko, Hatfield; Steven M. Pitzenberger, and George Hartman, both of Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 902,894, Sep. 2, 1986, Pat. No. 4,837,205. This application Feb. 1, 1989, Ser. No. 305,060

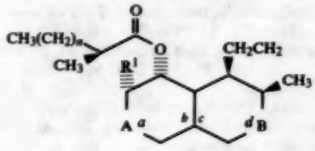
Int. Cl.[5] **A61K** *31/335, 31/70*; **C07D** *319/06*; **C07H** *15/26*

U.S. Cl. 514—452 **6 Claims**

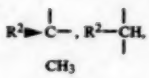
1. A compound represented by the general structural formula (I):

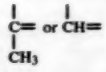


wherein:
R is (a)

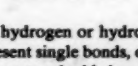


wherein:
n is 1 to 5;
R^1 is hydrogen or methyl;
A is

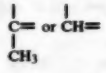




in which
R^2 is hydrogen or hydroxyl;
B is



in which R_3 is hydrogen or hydroxyl;
a, b, c and d represent single bonds, one and only one of a, b, c and d represents a double bond or both a and c only or both b and d only represent double bonds, provided that when a is a double bond, A is



and when d is a double bond, B is

R^7 is hydrogen or C_{1-6}alkyl;
R^8 is C_{1-6}alkyl; and
R^9 is C_{1-6}alkyl, C_{1-6}alkanoyloxy-C_{1-6}alkyl or C_{1-6}alkoxy carbonyloxy-C_{1-6}alkyl or a group selected from
(1) (5-(1,1-dimethylethyl)-2-oxo-1,3-dioxol-4-yl)methyl; or
(2) 2(β-D-galactosidyl)ethyl.

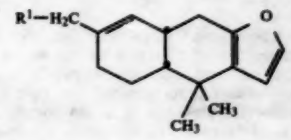
4,943,589

ANTHELMINTIC DYSININS OF MARINE ORIGIN

(I) **Phillip Crews, Santa Cruz; Thomas R. Matthews, Los Gatos, and Paul Horton, Santa Cruz, all of Calif., assignors to Systex (U.S.A.) Inc., Palo Alto and The Regents of the Univ. of California, Berkeley, both of, Calif.**

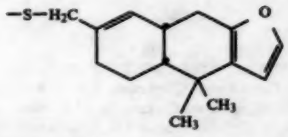
Filed Oct. 27, 1988, Ser. No. 263,261
Int. Cl.[5] A61K *31/34*; C07D *407/12*
U.S. Cl. 514—468 **13 Claims**

1. A method for treating helminthiasis which method comprises administering to an animal in need thereof an anthelmintically effective amount of a single enantiomer or a mixture of enantiomers of a compound of the Formula (I):



(I)

wherein
R^1 is hydrogen or $—SR^2$,
where
R^2 is hydrogen, —C(O)—CH_3, or



or a pharmaceutically acceptable salt thereof.

4,943,590

PHARMACEUTICALLY USEFUL (+)-1-(3-DIMETHYLAMINOPROPYL)-1-(4'-FLUOROPHENYL)-1,3-DIHYDROSOBENZOFURAN-5-CARBONITRILE AND NON-TOXIC ACID ADDITION SALTS THEREOF

Klaus P. Boegesoe, Lyngby, and Jens Perregaard, Jaegerspris, both of Denmark, assignors to H. Lundbeck A/S, Copenhagen-Valby, Denmark

Filed Jun. 8, 1989, Ser. No. 363,589
Claims priority, application United Kingdom, Jun. 14, 1988, 8814057
Int. Cl.[5] A61K *31/34*; C07D *307/87*
U.S. Cl. 514—469 **12 Claims**

1. A compound selected from substantially pure (+)-1-(3-Dimethylaminopropyl)-1-(4'-fluorophenyl)-1,3-dihydroisobenzofuran-5-carbonitrile and non-toxic acid addition salts thereof.

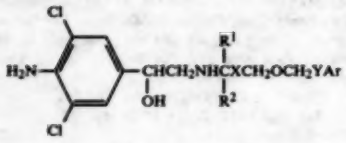
4,943,591

DICHLOROANILINE DERIVATIVES

Ian F. Skidmore, Welwyn; Lawrence H. C. Lunts, Broxbourne; Harry Finch, Hitchin; Alan Naylor, Royston, and Ian B. Campbell, The Blanes, all of England, assignors to Glaxo Group Limited, London, England

Continuation-in-part of Ser. No. 788,122, Oct. 16, 1985, abandoned. This application Oct. 14, 1986, Ser. No. 918,317
Claims priority, application United Kingdom, Oct. 17, 1984, 8426191; Oct. 15, 1985, 8525321
Int. Cl.[5] A61K *31/13*
U.S. Cl. 514—539 **8 Claims**

1. A compound of formula (I)



(I)

wherein

R^1 and R^2 each represent a hydrogen atom or a C_{1-3} alkyl group with the proviso that the sum total of carbon atoms in R^1 and R^2 is not more than 4;

X represents a C_{1-6} alkylene, C_{2-6} alkenylene or C_{2-6} alkynylene chain;

Y represents a bond, or a C_{1-4} alkylene, C_{2-4} alkenylene or C_{2-4} alknylene chain with the proviso that the sum total of carbon atoms in X and Y is not more than 8;

Ar represents a phenyl group substituted by a group $—NR^5COR^6$, where R^5 represents a hydrogen atom or a C_{1-4}alkyl group and R^6 represents a hydrogen atom or a C_{1-4}alkyl, C_{1-4}alkoxy or $—NR^3R^4$ group where R^3 and R^4 each represent a hydrogen atom, or a C_{1-4}alkyl group or Ar is a phenyl group substituted by a group $—(CH_2)_rR^7$ where r is 0 or 1 and R^7 is $—COR^9$ where R^9 represents hydroxy, C_{1-4}alkoxy or a group $—NR^3R^4$;

and their physiologically acceptable salts and solvates thereof.

4,943,593

INHIBITORS OF LYSYL OXIDASE

Michael G. Palfreyman, Cincinnati; Ian A. McDonald, Loveland, and Philippe Bey, Cincinnati, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 160,364, Feb. 25, 1988, abandoned. This application Sep. 19, 1989, Ser. No. 409,195

Int. Cl.[5] A61K *31/135, 31/15*

U.S. Cl. 514—649 7 Claims

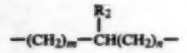
1. A method of treating diseases and conditions associated with the abnormal deposition of collagen in a patient in need thereof which comprises administering to the patient a therapeutically effective amount of a compound of the formula

wherein

X and Y are identical and are each either a fluoro, chloro, or bromo group or one of X and Y is a hydrogen and the other is a fluoro, chloro, or bromo group;

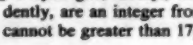
R_1 is a hydrogen or a $(C_1–C_4)$alkyl group;

A is a divalent radical group selected from



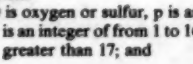
wherein

R_2 is hydrogen, methyl, or ethyl, and m and n, independently, are an integer from 0 to 16, provided that m+n cannot be greater than 17;



wherein

D is oxygen or sulfur, p is an integer of from 0 to 16, and q is an integer of from 1 to 16, provided that m+n cannot be greater than 17; and



wherein

s is an integer of from 1 to 16 and r is an integer of from 0 to 16, provided that r+s cannot be greater than 16; and

R is a methyl group, a phenyl, or a phenyl substituted with one or two members of the group $(C_1–C_5)$alkyl, $(C_1–C_5$)alkoxy, hydroxy, chloro, bromo, fluoro, iodo, trifluoromethyl, nitro, $(C_1–C_5)$alkylcarbonyl, benzoyl, or phenyl;

or a pharmaceutically acceptable salt thereof.

4,943,594

POLYIMIDE FOAM

Hiroshi Ezawa; Toshiyuki Nakakura; Takayuki Watanabe, and Hiroaki Tsushima, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

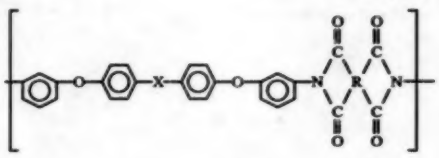
Filed Dec. 19, 1989, Ser. No. 454,061

Claims priority, application Japan, Dec. 28, 1988, 63-334660

Int. Cl.[5] C08J *9/06, 9/14*

U.S. Cl. 521—79 7 Claims

1. A process for the production of a thermoplastic polyimide foam comprising conducting extrusion foaming of a thermoplastic polyimide essentially consisting of recurring units represented by the formula (I):



(I)

wherein X is a radical selected from the group consisting of a direct bond, divalent hydrocabon having from 1 to 10 carbon atoms, hexafluorinated isopropylidene, carbonyl, thio, or a sulfonyl, and R is a tetravalent radical selected from the group consisting of an aliphatic radical having two or more carbon atoms, cycloaliphatic radical, monoaromatic radical, condensed polyaromatic radical, and non condensed polyaromatic radical wherein aromatic radicals are mutually connected with a direct bond or a crosslinking function, in the presence of a foaming agent selected from the group consisting of a sublimate substance, chemical foaming agent causing decomposition in the vicinity of 200° C., low boiling point organic compound and a hydrate dissociating water at a temperature of 200° C. or more.

4,943,595

PERFLUOROCHEMICALS AND PROCESS FOR PREPARING THE SAME

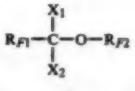
Kirby V. Scherer, Jr., Santamonica, Calif.; Konichi Yamanouchi, Sakai, Japan; Kazumasa Yokoyama, Toyonaka, Japan, and Ryoichi Naito, deceased, late of Ibaragi, Japan (by Kimie Naito, executor), assignors to The Green Cross Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 300,273, Sep. 8, 1981, abandoned. This application Feb. 22, 1984, Ser. No. 582,448

Int. Cl.[5] A61K *31/08;* C07C *43/12*

U.S. Cl. 514—722 16 Claims

1. A perfluoroether derivative suitable for use in a blood substitute and of the formula



[II]

wherein:

R_{F1} is a $C_3–C_7$ perfluoroalkyl group,

X_1 is a fluorine atom or a $C_1–C_3$ perfluoroalkyl group and

X_2 is a $C_1–C_3$ perfluoroalkyl group,

and RF_2 is a perfluoro C_2–C_5-alkyl group,

the total number of the carbon atoms contained in the perfluoroalkyl ether derivative being 10 to 11, inclusive, with the proviso that there is at least one branched chain perfluoroalkyl group in the molecule.

4,943,596

HIGH STRENGTH SILICONE FOAM, AND METHODS FOR MAKING

David C. Gross, Schenectady, N.Y.; Connie L. Haig, Evansville, Ind., and Jonathan D. Rich, Rexford, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 189,082, May 2, 1988, Pat. No. 4,810,728. This application Nov. 21, 1988, Ser. No. 274,536

Int. Cl.[5] C08J 9/06

U.S. Cl. 521—82 2 Claims

1. A method for making a high strength silicone foam, which comprises mixing a siloxane hydride with a mixture comprising a vinyl-containing siloxane, a hydroxy source material, an effective amount of a platinum catalyst, and a silicone polyimide block copolymer having from 1 to 75% by weight of chemically combined organovinylsiloxy units based on the weight of the silicone polyimide block copolymer.

4,943,597

POLYETHER POLYOL FORMULATIONS FOR HARD CFC REPLACEMENT BY WATER BLOWING IN RIGID POLYURETHANE FOAMS

Henri J. M. Grünbauer, Oostburg, Sweden; Johan A. Thoen, Dommerstraat, Netherlands, and Guido F. Smits, Wijnegem, Belgium, assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 7, 1988, Ser. No. 280,860

Int. Cl.[5] C08G 18/14, 18/48

U.S. Cl. 521—167 14 Claims

1. A process for preparing a rigid closed-cell polyisocyanate-based polymer having an average density of from about 6 to about 150 kg/m^3, which comprises reacting a polyol composition with an organic polyisocyanate in the presence of catalyst and a blowing agent containing water sufficient to provide from about 50 to about 80 theoretical mole percent carbon dioxide of the total gases present in the cells of the resulting polymer, said polyol composition comprising at least 50 percent by total weight of said polyol composition, a polyol having a hydroxyl number of from about 100 to about 500 and an average functionality of at least four, characterized in that the said polyol is the product of reacting a carbohydrate, or carbohydrate mixture additionally consisting of a member selected from the group consisting of water, glycerine, trimethylolpropane and mixtures thereof, with an alkylene oxide, in that the said polyol composition has an average hydroxyl number of from about 100 to about 500; and in that said polyisocyanate is used in an amount to provide from about 1.0 to about 1.5 isocyanate groups per active hydrogen including those of water present in the reacting system.

4,943,598

RECURABLE AND CURED CELLULAR MATERIALS

Gregory A. Ferro, Hoffman Estates, Ill., assignor to Imi-Tech Corporation, Elk Grove, Ill.

Division of Ser. No. 240,802, Sep. 6, 1988. This application Aug. 7, 1989, Ser. No. 389,983

Int. Cl.[5] C08J 9/36

U.S. Cl. 521—184 4 Claims

1. A process which comprises (i) exposing cured polyimide foam which is composed of a polyimide of at least one aromatic tetracarboxylic acid or derivative thereof and at least one aromatic or heterocyclic primary amine to an atmosphere of steam at elevated temperature and pressure for a period of time sufficient to convert said foam into a non-flexible, non-resilient recurable cellular material, (ii) shaping or contouring said cellular material, and (iii) heating to recure the shaped or contoured cellular material in the absence of steam into a shaped or contoured cured polyimide foam.

4,943,599

RECURABLE AND CURED CELLULAR MATERIALS

Gregory A. Ferro, Hoffman Estates, Ill., assignor to Imi-Tech Corporation, Elk Grove, Ill.

Division of Ser. No. 240,802, Sep. 6, 1988. This application Aug. 7, 1989, Ser. No. 390,070

Int. Cl.[5] C08J 9/36

U.S. Cl. 521—184 7 Claims

1. A process which comprises (i) exposing cured polyimide foam to an atmosphere of steam at elevated temperature and pressure for a period of time sufficient to convert said foam into a non-flexible, non-resilient recurable cellular material, (ii) shaping or contouring said cellular material, and (iii) heating to recure the shaped or contoured cellular material in the absence of steam into a shaped or contoured cured polyimide foam.

4,943,600

PHOTOCURABLE POLYAMINE-ENE COMPOSITIONS HAVING IMPROVED CURE SPEED

Gerry K. Noren, Hoffman Estates, and Edward J. Murphy, Arlington Heights, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Mar. 10, 1989, Ser. No. 321,148

Int. Cl.[5] C08F 32/06, 232/06

U.S. Cl. 522—106 3 Claims

1. A photocurable ethylenically unsaturated liquid coating composition consisting essentially of from about 20 to 30 weight percent of a tertiary amine-functional acrylic resin, from about 10 to 20 weight percent of an allyl-terminated polyester resin and from about 50 to 60 weight percent of an unsaturated maleate-functional polyester.

4,943,601

COATING WITH IMPROVED ADHESION

Anthony J. Dinallo, Sr., Mechanicville, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Apr. 3, 1989, Ser. No. 332,820

Int. Cl.[5] C08K 5/24

U.S. Cl. 524—265 9 Claims

1. A latent curable electronic coating composition stabilized against premature gelation comprising:

a. an olefinorganopolysiloxane having units of the structural formula:

$$R_aR^1{}_bSiO_{(4-a-b)/2}$$

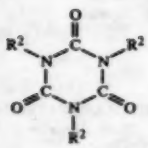
b. an organohydrogenpolysiloxane having units of the structural formula:

$$R_cSiH_dSiO_{(4-c-d)/2}$$

wherein R is selected from the group consisting of a monovalent hydrocarbon radical, a halogenated monovalent hydrocarbon radical, a cyanoalkyl radical and mixtures thereof, R^1 is an olefinic hydrocarbon radical, wherein a has a value of from 0 to 3, inclusive, b has a value of from 0.005 to 2.0 inclusive, and the sum of a and b is equal to from 0.8 to 3, inclusive,

c. a sufficient amount of a platinum catalyst to cause the co-reaction of (a) and (b);

d. a combination of inhibiting agents comprised of (i) an ethylenically unsaturated isocyanurate corresponding to the structural formula:



(III)

wherein R^2 is the same or different and is selected from the group consisting of hydrogen, alkyl, aryl, aralkyl polynuclear aryl, heteroaryl, monofunctional lower-alkenyl and the non-interfering substituted derivatives thereof with the proviso that at least one R^2 is lower-alkyl and (ii) a dialkylacetylenedicarboxylate having the structural formula:

ROOCC≡CCOOR

wherein R is as described above and wherein said combination of ethylenically unsaturated isocyanurate and said dialkylacetylenedicarboxylate is present in an amount sufficient to inhibit premature gelation but insufficient to prevent cure at elevated temperature; and

e. a silanol-containing dimethylsiloxane hydrolyzate having a silanol content from about 0.5% to about 1.5% and a viscosity from about 4 centipoise to about 40 centipoise at 25° C.

4,943,602

PREPARATION OF AQUEOUS POLYESTER DISPERSIONS AND USE THEREOF

Ralf Brueckmann, Goenheim; Heinz Leitner, Ladenburg, and Holger Schoepke, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengeseilschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 9, 1989, Ser. No. 320,963

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1988, 3808882

Int. Cl.[5] C08J *3/00*

U.S. Cl. 524—600 **3 Claims**

1. A process for preparing an aqueous polyester dispersion, which comprises

(a) condensing an aromatic dicarboxylic acid or ester with at least one diol to give a prepolymer having an acid number of from 2 to 8,

(b) reacting the prepolymer with at least one molecular weight enhancer compound selected from the group consisting of tricarboxylic acids, esters of tricarboxylic acids and carboxylic anhydrides having at least one free carboxyl group to give a polyester having an acid number of from 40 to 60, and

(c) dispersing the polyester in an aqueous medium to form an aqueous dispersion by adding an aqueous mixture of ammonia and an amine in a molar ratio of from 10:1 to 1:10 to a melt of the polyester which has a temperature within the range from 150° to 230° C.

4,943,603

REINFORCED POLYMER COMPOSITIONS HAVING EXCELLENT DISTINCTNESS OF IMAGE

Eloy C. Martinez, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 182,548, Apr. 18, 1988, Pat. No. 4,871,789. This application Aug. 30, 1989, Ser. No. 400,422

The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.

Int. Cl.[5] C08K *7/00, 3/34*

U.S. Cl. 523—220 **12 Claims**

1. A filled polymer composition comprising a polyurethane and/or polyurea matrix having dispersed therein a filler mixture comprising

(A) a reinforcing filler having particles of an average aspect ratio of at least 4 and an average particle length of at least about 20μ, except the average particle length is at least about 40μ when the reinforcing filler is wollastonite, and

(b) a supplementary filler comprising a wollastonite having an aspect ratio of 7 or less and a particle length of about 35μ or less or an inorganic compound other than wollastonite having an average aspect ratio of about 4 or less and a median particle size of about 10μ or less wherein the composition contains from about 5 to about 50weight percent of said reinforcing filler, and about 1 to about 20 weight percent of said supplementary filler, based on the weight of the polyurethane and/or polyurea matrix.

4,943,604

STRUCTURAL ADHESIVE HAVING EXCELLENT ANTI-CORROSION PROPERTIES

Yasuhiro Okuri, Mino, and Toshimori Sakakibara, Shiga, both of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Takatsuki, Japan

Filed Nov. 29, 1988, Ser. No. 277,345

Claims priority, application Japan, Nov. 30, 1987, 62-301681

Int. Cl.[5] C08K *5/52, 3/38, 3/26, 3/22*

U.S. Cl. 523—428 **5 Claims**

1. A structural adhesive having excellent anticorrosion properties which comprises:

(A) a rubber modified epoxy resin prepared by reaction of a bisphenol epoxy resin and a butadienacrylonitrile-(meth)acrylic acid copolymer,

(B) an urethane modified epoxy resin,

(C) a latent curing agent, and

(D) a rust inhibiting pigment selected from the group consisting of:

(i) a rust inhibiting pigment comprising aluminum orthophosphate and a zinc compound,

(ii) a rust inhibiting pigment comprising aluminum metaphosphate, a zinc compound and/or an alkaline earth metal compound, and

(iii) a rust inhibiting pigment comprising aluminum metaphosphate and a boric acid compound and optionally an alkaline earth metal compound,

wherein the adhesive contains said rubber modified epoxy resin (A) and said urethane modified epoxy resin (B) in a weight ratio of 1:9 to 3:1, and said latent curing agent (C) and said rust inhibiting pigment (D) at 0.1 to 30% by weight and at 5 to 50% by weight respectively based on a total amount of both modified epoxy resins (A) and (B).

4,943,605

END DAM NOSING MATERIAL

John D. Nicholas, Lawrenceville, Ga., assignor to MM Systems Corporation, Tucker, Ga.

Filed Feb. 29, 1988, Ser. No. 162,167

Int. Cl.[5] C08L *63/00, 27/06*

U.S. Cl. 523—438 **4 Claims**

1. An end dam nosing material consisting essentially of an epoxy resin, a liquid depolymerized elastomer, polyvinyl chloride pellets and an amount of curing agent effective to cure the epoxy resin and generate sufficient heat to cure the liquid depolymerized elastomer.

4,943,606

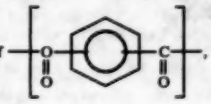
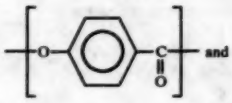
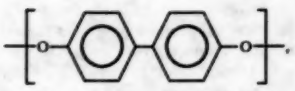
RESIN COMPOSITION FOR PRINTED CIRCUIT BOARD

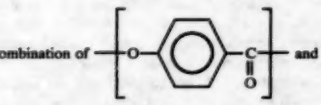
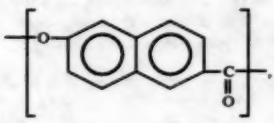
Masakazu Inoue, Shiga; Kuniaki Asai, Tondabayashi; Kazuo Hieda, Nishinomiya, and Tadayasu Kobayashi, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

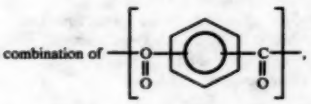
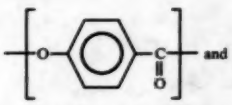
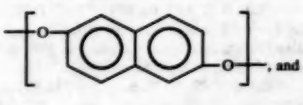
Filed Aug. 26, 1988, Ser. No. 236,721
Claims priority, application Japan, Sep. 1, 1987, 62-218610
Int. Cl.[5] C08K 3/26, 7/02; C08L 67/03
U.S. Cl. 523—457 8 Claims

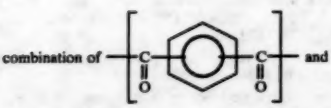
1. A resin composition for printed circuit board comprising:

(A) 30–90% by weight of a liquid crystal polyester having one of the following combinations of repeating units:

(I) a combination of  ,  and  ,

(II) a combination of  and  ,

(III) a combination of  ,  and  ,

(IV) a combination of  and

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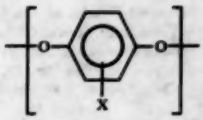


wherein X is alkyl, halogen or aryl,

(B) 3–50% by weight of an inorganic fibrous or acicular material having an average diameter of 15 μm or below and an average length of 200 μm or below, and

(C) 3–30% by weight of an alkaline earth metal carbonate.

8. A composition according to claim 1 further comprising at least one member selected from the group consisting of an antioxidant, a heat stabilizer, an ultraviolet absorber, a lubricant, a releasing agent, a dye, a pigment, a flame retardant, a flame-retarding aid, an antistatic agent, thermoplastic resins consisting of a polyamide, a polyester, a polyphenylene sulfide, a polyetherketone, a polycarbonate, a modified polyphenylene oxide, a polysulfone, a polyetherimide and a polyamideimide, and thermosetting resins consisting of a phenolic resin, an epoxy resin and a polyimide resin.

4,943,607

FIBER-REINFORCED UNSATURATED POLYESTER

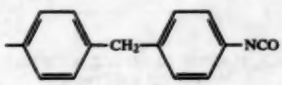
Hiroka Tanisake; Hiroyuki Okumura, both of Hiratsuka; Akira Namikawa, Fujisawa; Masato Ishikawa, Hiratsuka, and Toshiaki Abe, Yokohama, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Aug. 26, 1988, Ser. No. 237,229
Claims priority, application Japan, Aug. 31, 1987, 62-215492
Int. Cl.[5] C08K 7/02
U.S. Cl. 523—500 5 Claims

1. A fiber-reinforced unsaturated polyester resin composition comprising, as main components, an unsaturated polyester (A), a polyhydric alcohol (E), a polyisocyanate compound (B), a polymerizable vinyl monomer (C) and a fiber (D),

1 the unsaturated polyester (A) being obtained from a dicarboxylic acid or an anhydride thereof containing 40 to 100 mole % of an unsaturated dicarboxylic acid or its anhydride and a polyhydric alcohol having a primary hydroxyl group, and having a hydroxyl value of 115 to 210 mgKOH/g and acid value of not more than 5 mgKOH/g,

2 the polyisocyanate compound (B) having its terminal group of



and a viscosity, at 25° C., of 10 to 2,000 cps and being in the liquid state,

3 the polyhydric alcohol (E) having at least 2 hydroxyl group in the molecule and having a hydroxyl value of 35 to 1,100 mgKOH/g, and further, said composition satisfying the following conditions (i), (ii), (iii) and (iv);

(i) the proportion of (E) is 10 to 50% by weight of the total weight of (A) and (E),

(ii) the total weight of (A) and (E) is in the range of 50 to 85% by weight of the total weitht of (A), (E) and (C),

(iii) the molar ratio of the isocyanate group of (B) to the hydroxyl group of (A) and (E) is 0.75 to 1.2, and

(iv) the proportion of (D) is 50 to 70% by weight of the total weight of (A), (B), (C), (D) and (E).

4,943,608

ROSIN EMULSION SIZING AGENT

Mizunori Takahashi, Ichihara; Tsuyoshi Ikeda, and Yoshiharu Yamaguchi, both of Chiba, all of Japan, assignors to Dic-Hercules Chemicals, Inc., Tokyo, Japan

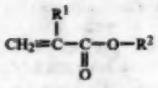
Filed Oct. 29, 1987, Ser. No. 113,907
Claims priority, application Japan, Nov. 5, 1986, 61-261942
Int. Cl.[5] C08L 93/04
U.S. Cl. 524—272 16 Claims

1. A rosin emulsion sizing agent consisting essentially of, by weight,

(1) from 20 to 50% of a fortified rosin,

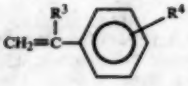
(2) from 1 to 30% of a partially or totally quaternized, cationized product of a copolymer consisting essentially of:

a. from 20 to 80% by weight of (a.1) a (meth)acrylic acid alkyl ester monomer of the general formula (I):



(I)

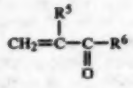
wherein R^1 is H or CH_3, and R^2 is one member selected from the group consisting of C_{1-18} alkyls, or of (a.2) a styrene monomer of the general formula (II):



(II)

wherein R^3 is H or CH_3, and R^4 is H or C_{1-4} alkyls, or of (a.3) both said (meth)acrylic acid alkyl ester monomer of general formula (I) and said styrene monomer of general formula (II); and

b. from 20 to 80% by weight of a (meth)acrylic acid alkylaminoalkyl ester or amide monomer of the general formula (III)



(III)

wherein R^5 is H or CH_3, and R^6 is mono- or di-lower-alkylamino-lower alkoxy or mono- or di-lower-alkylamino-lower alkylamino; said copolymer having a number average molecular weight of from 1,000 to 500,000; and

(3) the balance being water.

4,943,609

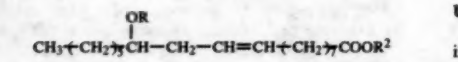
CURABLE RUBBER BLADDER STOCKS HAVING REDUCED VISCOSITY

Terrence M. Stuhldreher, Smyrna, Tenn., assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

Filed Apr. 17, 1989, Ser. No. 338,679
Int. Cl.[5] C08K 5/11, 9/00
U.S. Cl. 524—314 7 Claims

1. A cured tire curing bladder, comprising:

the cured tire bladder made from a curable bladder rubber and an effective amount of a derivative of ricinoleic acid, said derivative of ricinoleic acid having the formula



wherein R is

where R^1 is an aliphatic having from 1 to 12 carbon atoms, and wherein R^2 is an aliphatic having from 1 to 12 carbon atoms.

4,943,610

NON-SHRINKING, DIMENSIONALLY-STABLE MODIFIED EPOXY RESINS

David C. Sayles, P.O. Box 4741, Huntsville, Ala. 35815

Filed Nov. 30, 1987, Ser. No. 173,604
Int. Cl.[5] C08G 59/40, 59/62
U.S. Cl. 525—415 2 Claims

1. A non-shrinking, dimensionally-stable modified epoxy resin produced by combining and reacting the first component and the second component as defined under (A) (i) and (A) (ii) hereinbelow and an unmodified epoxy resin combined with said non-shrinking, dimensionally-stable modified epoxy resin and further reacted as defined under (B) hereinbelow to produce a matrix resin composition having controlled shrinkage and comporising:

(A) (i) the reaction product of an amount of a diglycidyl ether of Bisphenol A with an amount of a compound selected from 6-hexanolactone and 5-norbornene-2,2-dimethanol to produce a reaction product as a first component, said first component being utilized in an amount of about 100 parts by weight with a second component;

(A) (ii) said second component being a curing agent of hexahydrophthalic acid which is blended with said first component in an amount of about 40 parts by weight; said first and said second component reacted together at about 150° C. for about 2 hours to yield said non-shrinking, dimensionally-stable modified epoxy resin having a volume change on polymerization of not more than 0.03 percent which is blended with a third component which is the unmodified epoxy resin diglycidyl ether of Bisphenol A; and,

(B) said third component consisting of an additional amount from about 1 to 2 parts of said unmodified epoxy resin of diglycidyl ether of Bisphenol A which is blended with each part of said non-shrinking, dimensionally-stable modified epoxy resin and subsequently further cured at 375° F. for about 2½ hours to yield a matrix resin composition having a controlled shrinkage of about 1.4 to about 2.4 volume percent.

4,943,611

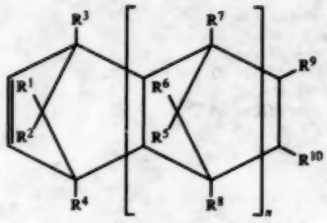
RESIN COMPOSITION FOR SPACERS OF INFORMATION RECORDING DISC

Akira Todo; Toshio Kimura; Takeshi Minoda, and Masayoshi Kurisu, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,685
Claims priority, application Japan, Jul. 27, 1987, 62-187250
Int. Cl.[5] C08G 59/50, 59/22
U.S. Cl. 524—493 3 Claims

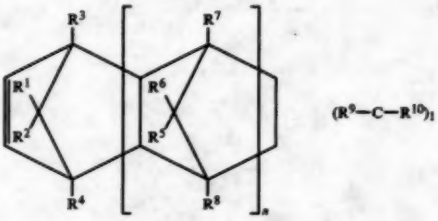
1. A resin composition for spacers of an information recording disc which comprises:

(A) a random copolymer of ethylene and at least one cycloolefin represented by the formula



(I)

or



(II)

wherein n and m each represents 0 or a positive integer, l is an integer of at least 3, and

R^1 to R^{10} independently represent a hydrogen atom, a halogen atom or a hydrocarbon group, and having an intrinsic viscosity [η] of from 0.05 to 10 dl/g, as measured in decalin at a temperature of 135° C., and

(B) from 0.01 to 5 parts by weight, based on 100 parts by weight of said copolymer (A), of at least one inorganic material selected from the group consisting of titanium oxide and silica having a particle size of not more than 300 μm.

4,943,612

ULTRA-FINE PARTICULATED POLYMER LATEX AND COMPOSITION CONTAINING THE SAME

Hiroshi Morita, Chiba; Eiichi Hirota, Funabashi, and Yasuo Ishizaki, Tokyo, all of Japan, assignors to Lion Corporation, Tokyo, Japan

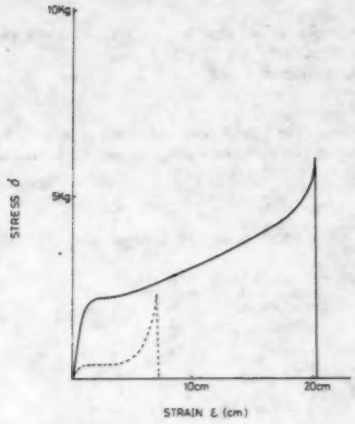
Filed Dec. 3, 1987, Ser. No. 128,657

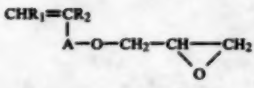
Claims priority, application Japan, Dec. 6, 1986, 61-290839; Dec. 6, 1986, 61-290840; Dec. 6, 1986, 61-290841; Dec. 6, 1986, 61-290842; Dec. 6, 1986, 61-290843; Dec. 6, 1986, 61-290844; Dec. 6, 1986, 61-290845; Dec. 6, 1986, 61-290846; Mar. 31, 1987, 62-76037; Apr. 24, 1987, 62-102731; Apr. 24, 1987, 62-102732; Apr. 24, 1987, 62-102733; Apr. 24, 1987, 62-102734; Apr. 24, 1987, 62-102735; Apr. 24, 1987, 62-102736; Apr. 24, 1987, 62-102737; Jun. 15, 1987, 62-149980; Jun. 15, 1987, 62-149982; Jun. 15, 1987, 62-149983

Int. Cl.[5] C08F 2/16, 2/24, 20/18

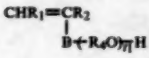
U.S. Cl. 524—714 **4 Claims**

1. An aqueous polymer latex having an average particle size of 100 nm or less, a crosslinked structure, and a measured glass transition temperature which is lower, by 3° C. or more, than its glass transition temperature when calculated by a weight fraction method, wherein said aqueous latex is derived from the emulsion copolymerization of (i) at least one unsaturated monomer selected from the group consisting of methacrylates, lower fatty acid vinyl esters, styrenes, vinyls, dienes, and vinyl pyridine and (ii) a comonmomer selected from the group consisting of copolymerizable unsaturated monomers having the formulae:





(II)



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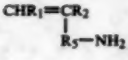

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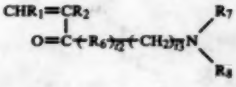
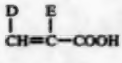


(V)



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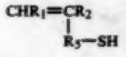
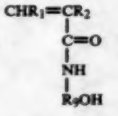


(VII)



(VIII)

wherein R_1, R_2, R_4, R_5, R_6, R_7, R_8, R_9, B, D, E, t_1, t_2 and t_3 have the following meanings:

R_1, R_2: hydrogen or methyl;

R_4: alkylene having 2 to 4 carbon atoms;

R_5: direct bond, alkylene having 1 to 3 carbon atoms, phenylene or substituted phenylene;

R_6: oxygen or —NH—;

R_7: hydrogen, alkylol having 1 to 5 carbon atoms;

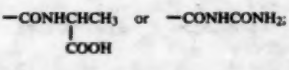
R8: hydrogen, alkylol having 1 to 5 carbon atoms or alkyl having 1 to 5 carbon atoms;

R_9: alkylene having 1 to 4 carbon atoms;

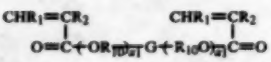
A: methylene or carbonyl;

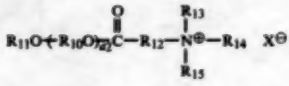
B: —CH_2O— or carboxyl;

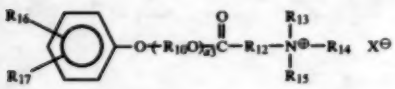
D: hydrogen alkyl having 1 to 3 carbon atoms, carboxyl,

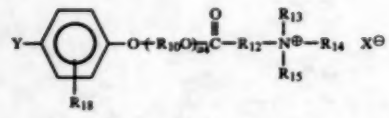


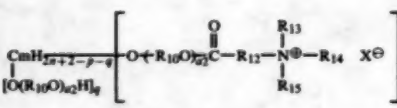
E: hydrogen atom, alkyl having 1 to 3 carbon atoms or $-CH_2COOH$;
t_1: real number of 1 to 20;
t_2: integer of 0 to 1; and
t_3: integer of 0 to 10;
in the presence of at least one emulsifying agent selected from the group consisting of emulsifiers having the formulae:

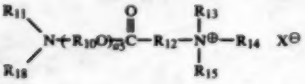

(IX)

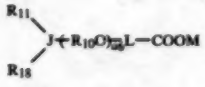

(X)

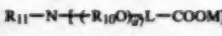

(XI)

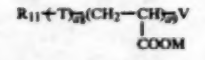

(XII)


(XIII)

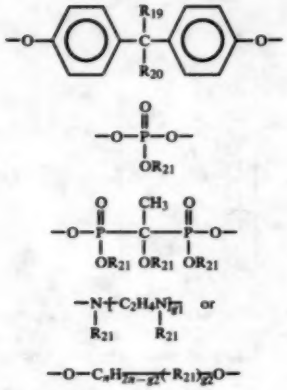

(XIV)


(XV)

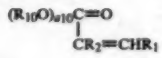

(XVI)


(XVII)

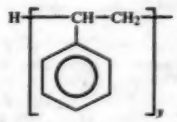
wherein R_1, R_2, R_{10}, R_{11}, R_{12}, R_{13}, R_{14}, R_{15}, R_{16}, R_{17}, R_{18}, a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9, a_{10}, G, J, L, M, T, X, Y and V have the following meanings:
R_1, R_2: hydrogen or methyl;
R_{10}: alklene having 2 to 4 carbon atoms;
R_{11}: alkyl or alkenyl having 8 to 30 carbon atoms, which are either straight or branched, preferably one having 8 to 18 carbon atoms;
R_{12}: alkylene having 1 to 5 carbon atoms;
R_{13}, R_{14}, R_{15}: alkyl having 1 to 3 carbon atoms or $-C_2H_4OH$, and the respective groups may be either the same or different;
R_{16}, R_{17}: alkyl having 6 to 20 carbon atoms or hydrogen, of which at least one is alkyl having 6 to 20 carbon atoms;
R_{18}: hydrogen, alkyl or alkenyl having 1 to 30 carbon atoms;
a_1, a_2, a_3, a_4, a_5, a_6, a_7: each represent average moles added,
a_1: real number of 1 to 50, and preferable the more number of alkylene oxide added in the molecule is 8 or more;
a_2: real number of 0 to 20;
a_3: real number of 0 to 20 when either one of R_{16} and R_{17} is alkyl, and a real number of 1 to 30 when both R_{16} and R_{17} are alkyls;
a_4: real number of 1 to 30;
a_5: real number of 0 to 20;
a_6: real number of 0 to 20;
a_7: real number of 0 to 20;
a_8: integer of 0 or 1;
a_9: real number of 2 to 20;
p: integer of 2 to 5;
q: integer of 0 to 3;
G:

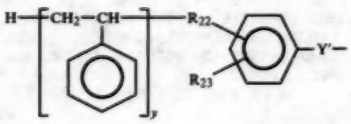


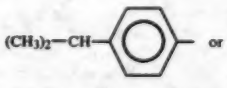
R_{19}, R_{20}: hydrogen or alkyl having 1 to 2 carbon atoms;
R_{21}: hydrogen or $-R_{10}O-a_{10}H$ or

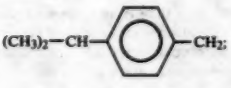


g_1: integer of 0 to 5;
g_2: integer of 0 to 10;
n: integer of 1 to 10;
a_{10}: real number of 1 to 50;
Y:

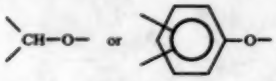




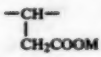

or



and y is a real number of 1 to 5;
R_{22}, R_{23}: hydrogen or alkyl having 1 to 20 carbon atoms;
y': alkylene having 3 to 8 carbon atoms, oxygen or carbonyl;
J: nitrogen,



L: alkylene having 1 to 5 carbon atoms or



T: direct bond, oxygen sulfur;
M: hydrogen or inorganic anion;
X: inorganic anion or organic anion;
V: hydrogen or halogen.

4,943,613

PHOTOCURABLE ORGANOPOLYSILOXANE COMPOSITION

Masatoshi Arai; Kazutoshi Fujioka, both of Annaka, and Masaharu Satou, Takasaki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 26, 1989, Ser. No. 357,977
Claims priority, application Japan, May 31, 1988, 63-133856
Int. Cl.[5] C08K 5/09
U.S. Cl. 524—773 **4 Claims**

1. A photocurable organopolysiloxane composition which comprises, in admixture:

(a) 100 parts by weight of an organopolysiloxane having, in a molecule, at least one acryloxy-functional group represented by the general formula

$$[CH_2{=}CR^1{-}CO{-}O{-}(CH_2)_a{-}SiR_{2-b}{-}O{-}]_b(R)_{3-b}Si{-}R^2{-},$$

in which R^1 is a hydrogen atom or a methyl group, each R is a monovalent hydrocarbon group independently from the others, R^2 is an oxygen atom or a divalent hydrocarbon group and each of the subscripts a and b is 1, 2 or 3;

(b) from 0.01 to 10 parts by weight of an acryloxy-containing trialkoxy silane represented by the general formula

$$(R^3O)_3Si{-}R^4{-}(NH{-}CO{-}O{-}R^4)_c{-}O{-}CO{-}CR^1{=}CH_2,$$

in which each R is a monovalent hydrocarbon group having 1 to 8 carbon atoms, each R^1 is a divalent hydrocarbon group having 1 to 20 carbon atoms independently from the others, R^1 has the same meaning as defined above and the subscript c is zero or 1;

(c) from 0.01 to 10 parts by weight of a carboxylic acid represented by the general formula

$$R^5{-}CO{-}OH,$$

in which R^5 is a monovalent hydrocarbon group having 1 to 20 carbon atoms; and

(d) from 0.01 to 10 parts by weight of a photosensitizer.

4,943,614

COATING COMPOSITION

Nobuyuki Miyazaki; Masao Unoki, both of Yokohama, and Seiji Munekata, Tokyo, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 260,040
Claims priority, application Japan, Oct. 20, 1987, 62-262753
Int. Cl.[5] C08F 8/32
U.S. Cl. 525—117 **17 Claims**

1. A coating composition comprising of fluorine-containing copolymer obtained by copolymerizing a fluoroolefin having from 2 to 4 carbon atoms, an N-vinyl-lactam, a monomer having a functional group which is cross-linkable with a curing agent selected from the group consisting of an aminoplast, a multivalent isocyanate, an epoxy group-containing compound, a polybasic acid or its anhydride, a metal oxide or derivative thereof capable of cross-linking said copolymers, and other monomers copolymerizable therewith in a proportion of from 30 to 70 mol %, from 5 to 68 mol %, from 2 to 40 mol % and from 0 to 63 mol %, respectively.

4,943,615

OLEFIN COPOLYMER COMPOSITION

Takashi Yamawaki, Ichihara, Japan, assignor to Idemitsu Petrochemical Company Limited, Tokyo, Japan and Neste Oy, Keilaniemi, Finland

Filed Aug. 26, 1988, Ser. No. 236,958
Claims priority, application Japan, Aug. 29, 1987, 62-215846
Int. Cl.[5] C08L 23/20, 23/08
U.S. Cl. 525—240 **14 Claims**

1. An olefin copolymer composition, which olefin copolymer composition contains (A) 25 to 97 wt. % of a propylene copolymer, and (B) 75 to 3 wt. % of a butene-1 copolymer having a content of propylene unit of 1 to 35 mol %, an intrinsic viscosity of 0.9 to 7.2 dl/g measured in decalin heated to 150° C., a value of weight-average molecular weight/number-average molecular weight of 4 to 15, a temperature difference of 2° to 40° C. between the highest value and the lowest value of the melting point measured by the differential scanning calorimetric analysis, and a propylene block property of 0.01 or lower measured by the nuclear magnetic resonance spectral analysis.

4,943,616

LIVING CATIONIC POLYMERIZATION PROCESS

Munmaya K. Mishra, Hudson, Ohio, and Akhtar Osman, Clearwater, Canada, assignors to Polysar Limited, Sarnia, Canada

Continuation of Ser. No. 333,024, Apr. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 224,370, Jul. 26, 1988, Pat. No. 4,908,421. This application Dec. 4, 1989, Ser. No. 445,170
Int. Cl.[5] C08F 4/14, 4/34, 10/10
U.S. Cl. 525—264 **37 Claims**

1. A living cationic polymerization process for producing a terminally functional polymer which comprises introducing a monomer charge, a Lewis acid and an organic peroxy compound selected from the group consisting of organic peroxide, organic hydroperoxide, peroxy carbonate, azo peroxy compound and peroxy esters into a suitable reaction vessel and polymerizing the monomer charge at a temperature of from about 0 degrees to about −80 degrees centigrade to form said terminally functional polymer, wherein said monomer charge comprises the sequential addition of isobutylene and a second monomer selected from the group consisting of conjugated diolefins and vinylidene aromatic monomers and said organic peroxy compound is charged in an amount of from 10^{-4} to about 10^{-1} moles per mole of said isobutylene.

4,943,617

LIQUID CRYSTALLINE COPOLYMER

Karl-Heinz Etzbach, Frankenthal, and Bernd Hisgen, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

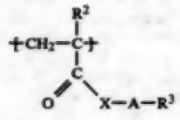
Filed Sep. 1, 1987, Ser. No. 91,667

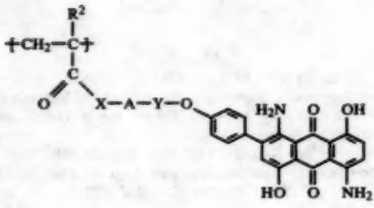
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631841

Int. Cl.[5] C08F 8/32

U.S. Cl. 525—329.9 **11 Claims**

1. A liquid crystalline copolymer which contains, as copolymerized units, a comonomer of the formula:

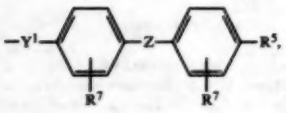


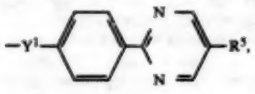


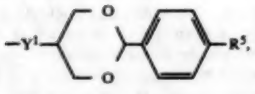
where X is a chemical bond, —O— or

wherein R^1 is hydrogen or C_1–C_4-alkyl, Y is a chemical bond or —CO—, A is a linear or branched C_2–C_{20}-alkylene group where the carbon chain of the alkylene group can be interrupted by —O— or

R^2 is hydrogen, methyl or chlorine and R^3 is a mesogenic group of the formula:







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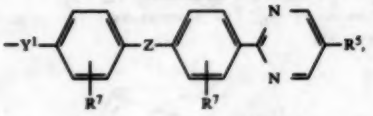
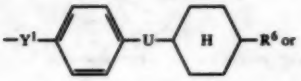
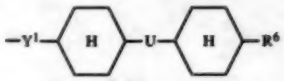
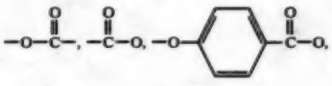
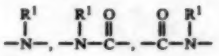




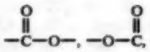


in which Y^1 is —O—,



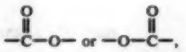


or —S—, Z is a chemical bond or a radical of the formula



—CH=CH—, —N=N,

—N=CH— or —CH=N—, U is a chemical bond or radical of the formula:



R^5 is hydrogen, C_1–C_{12}-alkyl, C_5–C_7-cycloalkyl, C_1–C_{12}-alkoxy, C_4–C_{12}-alkoxycarbonyl, C_1–C_{12}-alkanoyloxy, fluorine, chlorine, bromine, cyano, phenyl, 4-cyanophenyl or nitro, R^6 is hydrogen, C_1–C_{12}-alkyl, C_1–C_{12}-alkoxy or C_1–C_{12}-alkoxycarbonyl and R^7 is methyl, ethyl, methoxy, ethoxy or chlorine.

4,943,618

METHOD FOR PREPARING POLYACRYLONITRILE COPOLYMERS BY HETEROGENEOUS REACTION OF POLYACRYLONITRILE AQUAGEL

Vladimir A. Stoy; George P. Stoy, and Jan Lovy, all of Princeton, N.J., assignors to Kingston Technologies Limited Partnership, Dayton, N.J.

Filed Dec. 18, 1987, Ser. No. 135,070

Int. Cl.[5] C08F 8/40

U.S. Cl. 525—340 **68 Claims**

1. A method for preparing polyacrylonitrile copolymers comprising:

combining at least one polyacrylonitrile polymer in an aqua-

gel state with a fluid reagent which reacts with nitrile groups of the polyacrylonitrile, said at least one polyacrylonitrile polymer is maintained undissolved in the aquagel state throughout the reaction to yield said polyacrylonitrile copolymers.

4,943,619

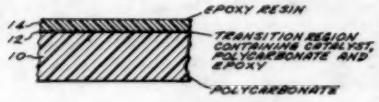
POLYCARBONATE-EPOXY POLYMER

James P. Bell, Storrs, Conn., and Yunzhao Yu, Beijing, China, assignors to The University of Connecticut, Storrs, Conn.

Filed Dec. 19, 1988, Ser. No. 286,529

Int. Cl.[5] C08F 283/02

U.S. Cl. 525—463 **26 Claims**



1. A method of making a polymer by reacting, in the presence of a catalyst, epoxide groups of an epoxy resin with in-chain carbonate groups of polycarbonate or polycarbonate oligomers to chemically bond said epoxide groups to said carbonate groups to produce a polycarbonate-epoxy polymer, said catalyst being catalytically effective to promote chemical bonding between said epoxide groups and said in-chain carbonate groups to produce said polycarbonate-epoxy polymer.

4,943,620

METHOD FOR THE PREPARATION OF A SILICONE-BASED PRESSURE-SENSITIVE ADHESIVE

Shiro Gomyo, and Takahide Kobori, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1989, Ser. No. 297,874

Claims priority, application Japan, Jan. 20, 1988, 63-10314

Int. Cl.[5] C08F 283/00

U.S. Cl. 525—474 **12 Claims**

1. A method for the preparation of a silicone-based pressure-sensitive adhesive which comprises the steps of:

(a) adding ammonia water to a mixture of a first organopolysiloxane having a substantially linear molecular structure represented by the average unit formula $R^1_mSiO_{(4-m)/2}$, in which R^1 is a substituted or unsubstituted monovalent hydrocarbon group and m is a positive number in the range from 1.8 to 2.1, at least 90% by moles of the organosiloxane units being diorganosiloxane units of the formula R^1_2SiO, and a second organopolysiloxane composed mainly of monofunctional siloxane units of the formula $R^2_3SiO_{0.5}$, in which R^2 is a substituted or unsubstituted monovalent hydrocarbon group, and tetrafunctional siloxane units of the formula SiO_2, the molar ratio of the monofunctional siloxane units to the tetrafunctional siloxane units being in the range from 0.4 to 2.0, to form a reaction mixture;

(b) agitating the reaction mixture to effect the siloxane rearrangement reaction between the first and the second organopolysiloxanes; and

(c) removing the ammonia water from the reaction mixture.

4,943,621

STORAGE STABLE COMPONENTS OF REACTIVE FORMULATIONS FOR BULK POLYMERIZATION OF CYCLOOLEFIN MONOMERS

Dennis J. Janda, Parma; Paul T. Stricharczuk, Twinsburg, and Robert J. Minchak, Parma Heights, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 4, 1988, Ser. No. 228,033

Int. Cl.[5] C08F 4/32, 4/52

U.S. Cl. 526—127 **24 Claims**

1. A method for producing a storage stable cocatalyst component of a reactive formulation, wherein said reactive formulation comprises one or more cycloolefin monomers having a norbornene moiety together with a ring-opening metathesis catalyst system in sufficient quantity to polymerize these cycloolefin monomers in bulk,

said cocatalyst component comprising one or more cycloolefin monomers having a norbornene moiety combined with a halometal activated cocatalyst,

said method comprising the following sequential steps:

first, forming a mixture comprised of one or more cycloolefin monomers and a cocatalyst, said cocatalyst being the reaction product of an alkyl aluminum or alkyl aluminum halide with an active hydroxy-containing compound, and

second, adding a halometal activator to said mixture.

4,943,622

PROCESS FOR PRODUCING PEROXIDE-VULCANIZABLE, FLUORINE-CONTAINING ELASTOMER

Akihiro Naraki; Masatoshi Abe; Shin Okamoto, and Jun Okabe, all of Kitaibaraki, Japan, assignors to Nippon Mektron, Limited, Tokyo, Japan

Filed May 17, 1988, Ser. No. 194,941

Int. Cl.[5] C08F 2/38

U.S. Cl. 526—206 **5 Claims**

1. A process for producing a peroxide-vulcanizable, fluorine-containing elastomer, which comprises homopolymerizing or copolymerizing a fluorine-containing olefin having 2 to 8 carbon atoms in the presence of an iodine and bromine-containing compound represented by the general formula:

RBrn Im

where R is a fluorohydrocarbon group, a chlorofluorohydrocarbon group, a chlorohydrocarbon group or a hydrocarbon group, and n and m are integers of 1 and 2, and 1,1-difluoro-2-bromoethylene.

4,943,623

PROCESS FOR THE PRODUCTION OF POLYESTERS AND THEIR USE AS BINDER OR BINDER COMPONENT IN POWDER LACQUERS

Wolfgang Ebert; Rolf-Volker Meyer, and Hans-Joachim Kreuder, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Nov. 21, 1988, Ser. No. 273,949

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740932

Int. Cl.[5] C08G 63/02

U.S. Cl. 528—272 **7 Claims**

1. In an improved powder lacquer containing a binder, the improvement which comprises said binder or a component of said binder being a polyester containing hydroxyls, carboxyls or both and having an acid value of up to 50 and a hydroxyl value of up to 200, wherein the sum of the hydroxyl value and the acid value is from 20 to 200, which polyester has been produced by reacting

(a) an acid component which is at least 50% by weight of terephthalic acid

with

(b) a polyol component which is at least one polyhydric alcohol having a molecular weight in the range from 62 to 250,

while maintaining an equivalent ratio of carboxyl groups to hydroxyl groups of from 0 65:1 to 1.5:1, with the proviso that component (b) is used in a quantity of at least 30% by weight, based on the weight of component (a), and the reaction is carried out in the presence of

(c) at least 5% by weight, based on the weight of components (a) and (b), of a solvent containing amide groups,

lactam groups, or both and said solvent is free from any nitrogen-hydrogen bonds.

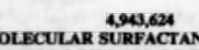
4,943,624

SUPRAMOLECULAR SURFACTANTS: AMPHIPHILIC POLYMERS DESIGNED TO DISRUPT LIPID MEMBRANES

Steven L. Regen, Bethlehem, Pa., assignor to Lehigh University, Bethlehem, Pa.

Filed Oct. 28, 1988, Ser. No. 263,871
Int. Cl.[5] C07C 69/34; C08G 63/66; A61K 31/745, 7/00
U.S. Cl. 528—301 7 Claims

1. An amphiphilic polymer, having the monomer unit structure A:



(A)

wherein R is at least one of H and C_{1-6} alkyl, k=1–4, m=10–30, n=12–50 and x=2–500.

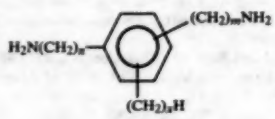
4,943,625

ADHESIVE COPOLYAMIDE COMPOSITION BASED ON PHENYLENE CONTAINING DIAMINE

Manfred Hewel, Bonaduz, Switzerland; Annette Lavalette, Richmond, England, and Frank Annighofer, Heidenrod, Fed. Rep. of Germany, assignors to Ems-Inventa AG, Domat/Ems, Switzerland

Filed Sep. 7, 1988, Ser. No. 241,406
Claims priority, application Switzerland, Sep. 9, 1987, 03472/87
Int. Cl.[5] C08G 69/14
U.S. Cl. 528—324 23 Claims

1. An adhesive copolyamide composition based on at least one first polyamide-forming component selected from the group consisting of aromatic diamines having 6 to 22 carbon atoms of the formula



wherein

n=0 to 6, m=0 to 6, and x=0 to 4, and salts thereof;

at least one second polyamide-forming component selected from the group consisting of aliphatic dicarboxylic acids having 6 to 12 carbon atoms and aliphatic diamines having 6 to 12 carbon atoms and;

at least one aromatic dicarboxylic acid having 8 to 10 carbon atoms;

said composition having:

(a) a dry powder differential scanning calorimetry (DSC) melting point of at least 100° C., measured at a heating rate of 20° C. per minute,

(b) a dry powder glass transition temperature not exceeding 60° C.,

(c) a dry powder softening point, measured by the Kofler-Bank method, of at least 100° C., and

(d) a Kofler-Bank wet softening point, measured on dampened powder, of less than 100° C.,

whereby a bond formed from said composition in the presence of moisture is heat-resistant to at least 100° C.

4,943,626

PRIMARY POLYETHER ACTIVE HYDROGEN COMPOUNDS WHICH ARE PREPARED FROM LINKED, PROTECTIVELY INITIATED POLYALKYLENEOXIDES

James E. McGrath; Youngtai Yoo, both of Blacksburg, Va.; Robert B. Turner, and Diane M. Lewis, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 29, 1988, Ser. No. 226,302
Int. Cl.[5] C08G 81/00, 65/30, 65/32
U.S. Cl. 528—408 30 Claims

1. A process for producing a polyether active hydrogen compound having at least two active hydrogen groups on primary carbon atoms per molecule comprising (a) forming polyoxyalkylene molecules each having at least one active hydrogen precursor group, by exposing a reaction mixture containing at least one 1,2-epoxyalkane and at least one protective initiator to conditions effective for the polymerization of the 1,2-epoxyalkane; (b) linking at least two of the polyoxyalkylene molecules using a linking agent to form a linked molecule having at least two termini each having an active hydrogen precursor group thereon; and (c) cleaving or transforming the active hydrogen precursor groups at said termini of the linked molecule to form active hydrogen groups on primary carbon atoms by means of reduction, hydrogenation, acidification, hydrogenolysis, hydrolysis, or oxidation.

24. A process for producing a polyether active hydrogen compound having at least two terminal active hydrogen groups on primary carbon atoms per molecule comprising (a) forming polyoxyalkylene molecules each having at least one active hydrogen precursor group, by exposing a reaction mixture comprising at least one substituted alkylene oxide and at least one intramolecular protective initiator having a functional group convertible into an active hydrogen group on a primary carbon atom to conditions effective for the polymerization of the substituted alkylene oxide; (b) linking at least two of the polyoxyalkylene molecules using a linking agent to form a linked molecule having at least two termini each having an active hydrogen precursor group thereon; and (c) cleaving or transforming the active hydrogen precursor groups at said termini of the linked molecule to form active hydrogen groups on primary carbon atoms by means of reduction, hydrogenation, acidification, hydrogenolysis, hydrolysis, or oxidation.

4,943,627

PEPTIDES INVOLVED IN THE PATHOGENESIS OF HIV INFECTION

Walter Gilbert, Cambridge; Richard A. Fisher, Brookline; Vicki L. Sato, Cambridge, and Johann J. Leban, Sommerville, all of Mass., assignors to Biogen, Inc., Cambridge, Mass.

Continuation of Ser. No. 873,621, Jun. 12, 1986, abandoned.
This application Aug. 16, 1988, Ser. No. 234,009
Int. Cl.[5] C07K 7/08, 7/10
U.S. Cl. 530—324 3 Claims

1. A peptide involved in the pathogenesis of the HIV virus selected from the group consisting of peptides consisting of amino acid sequences of the formulae: PWNASWSNK-SLEQIWNN and LLELDKWASLWNWF.

4,943,628

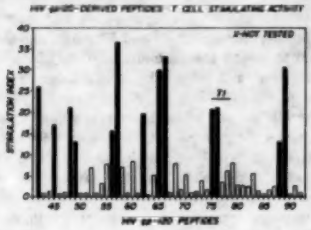
HIV PEPTIDE-INDUCTED T CELL STIMULATION

Jonathan I. Rosen, and John F. Warner, both of San Diego, Calif., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jun. 13, 1988, Ser. No. 205,983
Int. Cl.[5] C07K 7/08
U.S. Cl. 530—326 1 Claim

1. A peptide selected from the group consisting of:
HGIRPVVSTQLLLNG,
SLAEEEVVIRSANFT,
DNAKTIIVQLNQSVE,
IIVQLNQSVEINCTR,

GRAFVTIGKIGNMRQ,
TIGKIGNMRQAHCNI,
GNMRQAHCNISRAKW,
LREQFGNNKTIIFKQ,
SSGGDPEIVTHSFNC



PEIVTHSFNCGGEFF,
ITLPCRIKQIINMWQ,
RIKQIINMWQEVGKA,
WRSELYKYKVVKIEP, and
YKYKVVKIEPLGVAP.

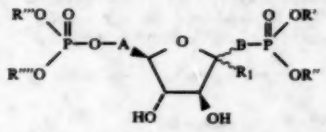
4,943,629

ANTIDIABETIC ALPHA-SUBSTITUTED PHOSPHONATES

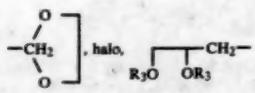
Vera G. DeVries, Ridgewood; Thomas H. Claus, Montvale, both of N.J.; Middleton B. Floyd, Jr., Suffern, and Semiramis Ayral-Kaloustian, Tarrytown, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 12, 1988, Ser. No. 232,331
Int. Cl.[5] C07H *11/04*
U.S. Cl. 536—117 **29 Claims**

1. A compound selected from those of the formula:



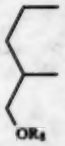
wherein A is selected from the group consisting of C_1–C_4 alkylene and C_2 to C_4 hydroxyalkylene; B is selected from the group consisting of C_1 to C_4 alkylene and C_2 to C_4 hydroxyalkylene in which the carbon atom of the alkylene moiety or the hydroxyalkylene moiety which is adjacent to the phosphorous atom is mono- or disubstituted with a substituent selected from the group consisting of halogen, hydroxy, and C_1 to C_4 alkoxy; R_1 is selected from the group consisting of hydrogen, C_1 to C_4 alkyl, C_1 to C_4 hydroxyalkyl, C_2 to C_4 dihydroxyalkyl, C_3 or C_4 trihydroxyalkyl and C_4 tetrahydroxyalkyl; R', R'', R''' and R'''' are selected independently from the group consisting of hydrogen, C_1 to C_{18} alkyl, C_3 to C_6 cycloalkyl, phenyl, C_3 to C_8 isoalkyl, Cl_3CCH_2—, $CH_2CH{=}CH_2$—, ZCH_2CH_2— [where Z is SO_2R_2, SR_2, OR_2, or $Si(R_2)_3$, and R_2 is $C_1$to C_3 alkyl],



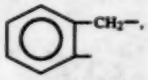
[where R_3 is C_1 to C_3 alkyl and R_3–R_3 is alkylene or acetal],

(where R_4 is hydrogen or methyl),

[where, when R_5=R_6 they are both hydrogen, fluoro or C_1–C_4 alkyl, R_5 is hydrogen, R_6 is fluoro, oxy or OR_7 [where R_7 is C_1 to C_6 alkyl, C_3 to C_6 cycloalkyl or aryl]],



[where R_8 is hydrogen or C_1 to C_{18} alkyl],



phenylmethyl, substituted phenylmethyl wherein the substituents are selected from C_1 to C_{18} alkyl, C_1 to C_6 alkoxy, NO_2 and halogen, and mono- and disubstituted phenyl wherein the substituents are selected from C_1 to C_{18} alkyl, C_1 to C_6 alkoxy, NO_2 and halogen; and, when any one or more of R', R'', R''' or R'''' are hydrogen, the pharmacologically acceptable salts thereof.

4,943,630

METHOD FOR CARRYING OUT THE ORGANIC SYNTHESIS OF OLIGOSACCHARIDES CONTAINING GALACTOSAMINE-URONIC ACID PATTERNS, NEW OLIGOSACCHARIDES OBTAINED AND BIOLOGICAL APPLICATIONS THEREOF

Jean-Claude Jacquinet, Orleans-La Source; Maurice Petitou, Paris; Pierre Sina , Orleans, and Jean Choay, Paris, all of France, assignors to Choay, S.A., Paris, France

Continuation of Ser. No. 624,628, Jun. 26, 1984, abandoned.
This application Apr. 21, 1986, Ser. No. 856,855
Claims priority, application France, Oct. 27, 1982, 82 18003
The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.
Int. Cl.[5] A61K *31/70*; C07H *5/06*
U.S. Cl. 536—123 **53 Claims**

1. A process for synthesizing an acid mucopolysaccharide condensation product having from 2–12 saccharides which process comprises condensing a first saccharide with a second saccharide to form a condensation product having a 1–4 beta linkage between the first saccharide and the second saccharide,

wherein the first saccharide is selected from the group consisting of a protected D-galactosamine unit and an oligosaccharide comprised of alternating protected D-galactosamine and protected uronic acid units linked in the manner found in chondroitin sulfate and dermatan sulfate and having a terminal D-galactosamine at the reducing end, and

wherein the second saccharide is selected from the group consisting of a uronic acid unit and an oligosaccharide comprised of alternating protected D-galactosamine and protected uronic acid units linked in the manner found in chondroitin sulfate and dermatan sulfate and having a terminal uronic acid at the now reducing end, further

wherein any uronic acid unit is selected from the group consisting of D-glucuronic acid and L-iduronic acid and further

wherein any D-galactosamine units have nitrogen containing groups at carbon 2, which nitrogen containing groups can be treated to form an amine.

4,943,631

PROCESS FOR CEPHEM COMPOUNDS

Brian E. Looker, Greenford, England, assignor to Glaxo Group Limited, London, England

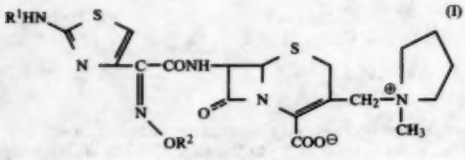
Continuation-in-part of Ser. No. 781,744, Sep. 30, 1985, abandoned. This application Jan. 6, 1988, Ser. No. 141,192

Claims priority, application United Kingdom, Oct. 1, 1984, 8424692

Int. Cl.[5] **C07D** *501/04*

U.S. Cl. 540—222 **6 Claims**

1. A process for the preparation of a compound of formula (I)



(I)

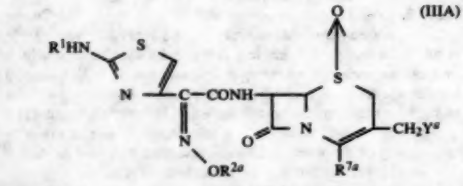
wherein

R^1 is a hydrogen atom or an amino-protecting group; and

R^2 is a straight or branched chain C_{1-4} alkyl group, an allyl, but-2-enyl or but-3-enyl group, or is a group of formula

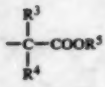
wherein each of R^3 and R^4 is independently a hydrogen atom or a methyl or ethyl group, or R^3 and R^4 taken together with the carbon atom to which they are attached may be a C_{3-5} cycloalkylidene group, or a non-toxic pharmaceutically acceptable salt or a metabolically labile ester thereof or a solvate of such a compound,

which process comprises reducing a compound of formula (IIIA)



(IIIA)

wherein R^1 is a hydrogen atom or an amino protective group; R^{2a} is a straight or branched chain C_{1-4} alkyl group, an allyl, but-2-enyl, or but-3-enyl group, or is a group of formula



wherein each of R^3 and R^4 is independently a hydrogen atom or a methyl or ethyl group, or R^3 and R^4 taken together with a carbon atom to which they are attached may be a C_{3-5} cycloalkylidene group, and R^5 is a hydrogen atom or carboxyl blocking group;

Y^a is a 1-pyrrolidino or 1-methyl-1-pyrrolidinium group, and R^{7a} represents the group —$COOR^6$, where R^6 is a hydrogen atom or a carboxyl blocking group, or when Y^a represents 1-methyl-1-pyrrolidinum, R^{7a} may additionally represent the group —COO,

or a salt thereof to form the corresponding sulphide compound; and if necessary or desired:

(a) methylation of a 3-(1-pyrrolidino)methyl compound to form the corresponding 3-(1-methyl-1-pyrrolidinium)-methyl compound;

(b) formation of a non-toxic salt or a non-toxic metabolically labile ester; and

(c) removal of any carboxyl blocking and amino protecting groups.

4,943,632

CEFTAZIDIME DIHYDROCHLORIDE FORMIC ACID SOLVATES

Colin Robinson, Ulverston, England, assignor to Glaxo Group Limited, London, United Kingdom

Filed Feb. 3, 1989, Ser. No. 305,541

Claims priority, application United Kingdom, Feb. 5, 1988, 8802622

Int. Cl.[5] **C07D** *501/46*

U.S. Cl. 540—225 **10 Claims**

1. (6R,7R)-7-[(Z)-2-(2-Aminothiazol-4-yl)-2-(2-carboxyprop-2-oxyimino)acetamido]-3-(1-pyridiniummethyl)ceph-3-em-4-carboxylate dihydrochloride (ceftazidime dihydrochloride) in the form of a crystalline formic acid solvate.

4,943,633

CATALYTIC PREPARATION OF CYANOALKYL LACTAMS

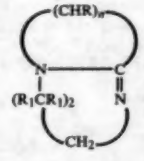
Richard V. C. Carr, Allentown, and Thomas A. Johnson, Orefield, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 22, 1988, Ser. No. 209,733

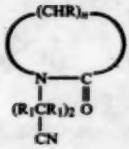
Int. Cl.[5] **C07D** *201/08, 471/02*

U.S. Cl. 540—531 **8 Claims**

1. In a process for the preparation of a diazabicycloalkene of the formula:



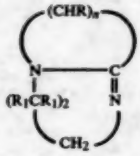
wherein R is H, or methyl, R_1 is H, methyl or ethyl, and n is a number ranging from 2–11 by reacting a lactam with an alpha-beta unsaturated nitrile having from 3–6 carbon atoms under conditions for producing a cyanoalkyl-lactam of the formula:



wherein R is H, or methyl, R_1 is H, methyl or ethyl, and n is a number ranging from 2–11; and then,

hydrogenating the cyanoalkyl-lactam under conditions for reducing the nitrile group to the amine intermediate N-amino alkyl lactam and effecting dehydration and cyclization of the N-amino alkyl lactam and thereby forming said diazabicycloalkene, the improvement which comprises:

reacting said lactam with said alpha-beta unsaturated nitrile having from 3–6 carbon atoms in the presence of a catalyst consisting essentially of a diazabicycloalkene of the formula:



wherein, R, R_1, and n have the above meaning; and without effecting separation of the cyanoalkyl-lactam reaction product prior to effecting hydrogenation.

4,943,634

N-HETEROCYCLIC BENZAMIDES

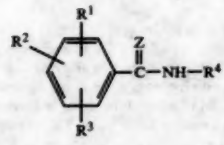
Kenneth W. Burow, Jr., Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 805,020, Dec. 5, 1985, Pat. No. 4,801,718, which is a division of Ser. No. 685,922, Dec. 24, 1984, Pat. No. 4,636,243, which is a division of Ser. No. 510,699, Jul. 5, 1983, Pat. No. 4,515,625, which is a division of Ser. No. 302,323, Sep. 14, 1981, Pat. No. 4,416,683, which is a continuation-in-part of Ser. No. 187,675, Sep. 16, 1980, abandoned. This application Nov. 14, 1988, Ser. No. 270,907

Int. Cl.[5] C07D 237/20; A01N 43/58

U.S. Cl. 544—224 **26 Claims**

1. An N-aryl benzamide of the formula



wherein:

Z is oxygen or sulfur;

R^1 is hydrogen, and

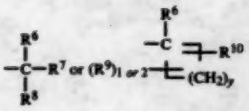
R^2 and R^3 independently are C_1–C_4 alkyl, C_1–C_4 alkylthio, or C_1–C_4 alkoxy;

R^4 is

in which:

R is hydrogen or C_1–C_4 alkyl;

R^5 is

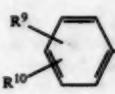


wherein:

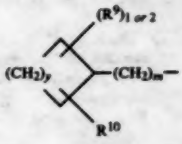
R^6 is hydrogen, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_6 alkoxy, or C_1–C_6 alkylthio;

y is an integer from 0 to 5;

R^7 and R^8 independently are hydrogen, C_1–C_{13} alkyl, halo-C_1–C_{13} alkyl, C_2–C_{13} alkenyl, C_2–C_{13} alkynyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, C_1–C_4 alkoxy-C_1–C_6 alkyl, C_1–C_4 alkylthio-C_1–C_6 alkyl, C_2–C_4 alkanoyloxy-C_1–C_6 alkyl,



or



wherein:

m is an integer from 0 to 4;

n is zero or 1;

R^9 and R^{10} independently are hydrogen, halogen, C_1–C_4 alkyl, or C_2–C_4 alkenyl;

and the agronomically acceptable salts thereof.

4,943,635

ENANTIOSELECTIVE REDUCTION OF KETONES

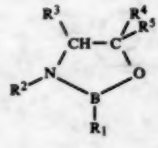
Elias J. Corey, Cambridge, Mass., assignor to President & Fellows of Harvard College, Cambridge, Mass.

Continuation-in-part of Ser. No. 90,196, Aug. 27, 1987, abandoned. This application Jul. 29, 1988, Ser. No. 224,697

Int. Cl.[5] C07B 53/00; C07F 5/02

U.S. Cl. 546—13 **30 Claims**

1. A chiral 1,3,2-oxazaborolidine of the formula:



in which:

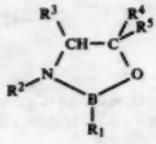
R_1 is lower alkyl or aralkyl;

R_2 is hydrogen, methyl, or ethyl;

R_3 is alkyl, aryl, or aralkyl; or R_2 and R_3, taken together with that part of the oxazaborolidine ring to which they are attached, form a 4-, 5-, or 6-membered ring, carbocyclic except for the oxazaborolidine nitrogen; and

R_4 and R_5 are independently alkyl, aryl, or aralkyl; or R_2 and R_4, taken together with that part of the oxazaborolidine ring to which they are attached, form a 5- or 6-membered ring, carbocyclic except for the oxazaborolidine nitrogen, and R_5 is hydrogen, or R_2, R_3, and R_4, taken together with that part of the oxazaborolidine ring to which they are attached, form two 5-membered ring, carbocyclic except for the oxazaborolidine nitrogen, cis-fused at the CH—R_3 bond.

11. A chiral 1,3,2-oxazaborolidine of the formula:



in which:

R_1 is hydrogen, lower alkyl, or aralkyl; and either:

(1) R_2 and R_3, taken together with that part of the oxazaborolidine ring to which they are attached, form a 4-, 5-, or 6-membered ring, carbocyclic except for the oxazaborolidine nitrogen; and R_4 and R_5 are independently alkyl, aryl, or aralkyl, or

(2) R_2 and R_4, taken together with that part of the oxazaborolidine ring to which they are attached, form a 5- or 6-membered ring, carbocyclic except for the oxazaborolidine nitrogen; R_3 is alkyl, aryl, or aralkyl; and R_5 is hydrogen, or

(3) R_2, R_3, and R_4, taken together with that part of the oxazaborolidine ring to which they are attached, form two 5-membered rings, carbocyclic except for the oxazaborolidine nitrogen, cis-fused at the CH—R_3 bond; and R_5 is alkyl, aryl, or aralkyl.

4,943,636

CERTAIN PYRIDYL-DI-SULFIDE-ALKYLENECARBONXYLATE-ORTHO-NITRO-PHENYLSULFONIC ACID ESTERS USEFUL FOR COUPLING BIOLOGICAL MATERIALS

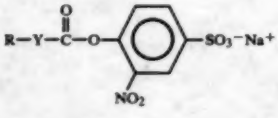
Danute E. Nitecki, Berkeley, and Lois Aldwin, San Mateo, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 839,447, Mar. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 637,905, Aug. 9, 1984, abandoned. This application Sep. 10, 1987, Ser. No. 95,387

Int. Cl.[5] C07D *213/34*

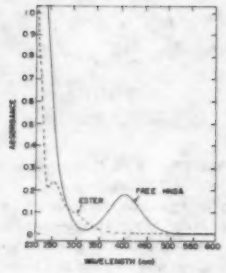
U.S. Cl. 546—294 **5 Claims**

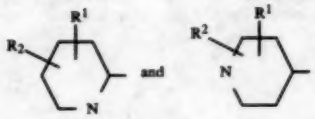
1. A water-soluble ester useful for coupling biological materials, said ester being of the formula:



wherein R is

wherein Q is selected from the group consisting of





wherein R^1 and R^2 are independently selected from the group consisting of H, NO_2 and COOH, and Y is a divalent space moiety covalently linking R to the carboxyl carbon of the ester, and selected from the group consisting of acylic saturated linear alkylene having 1–10 carbon atoms, branched alkylene having 1–10 carbon atoms and cycloalkylene having 5 to 8 carbon atoms in their cyclic rings.

4,943,637

METHOD FOR PREPARING 2-PHENYLBENZOTRIAZOLES

Shuichi Seino, Kobe, and Tomizo Fujino, Akashi, both of Japan, assignors to Chemipro Kasei Kaisha, Ltd., Hyogo, Japan

Continuation of Ser. No. 932,457, Nov. 18, 1986, abandoned. This application Aug. 12, 1988, Ser. No. 232,567

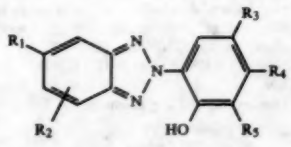
Claims priority, application Japan, Sep. 16, 1986, 61-218864; Sep. 16, 1986, 61-218865

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.[5] C07D *249/20*

U.S. Cl. 548—260 **18 Claims**

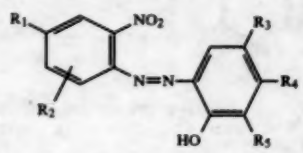
1. A method for preparing a 2-phenyl-benzotriazole of formula I,



(I)

wherein R_1 represents hydrogen, chlorine, a lower alkyl group having a carbon number of 1 to 4, a lower alkoxy group having a carbon number of 1 to 4, carboxyl group or a sulfonic acid group; R_2 represents hydrogen, chlorine, a lower alkyl group having a carbon number of 1 to 4, or a lower alkoxy group having a carbon number of 1 to 4; R_3 represents hydrogen, chlorine, an alkyl group having a carbon number of 1 to 12, a lower alkoxy group having a carbon number of 1 to 4, a phenyl group, a phenyl group substituted with an alkyl group which has a carbon number of 1 to 8, a phenoxy group or a phenylalkyl group, the alkyl portion of which having a carbon number of 1 to 4; R_4 represents hydrogen, chlorine, hydroxy group, or a lower alkoxy group having a carbon number of 1 to 4; and R_5 represents hydrogen, an alkyl group having a carbon num-

ber of 1 to 12, or a phenylalkyl group, the alkyl part of which having a carbon number of 1 to 4 comprising: reducing an o-nitroazobenzene of formula III,



(III)

wherein R_1, R_2, R_3, R_4 and R_5 are as defined above with an alcohol reducing agent of at least one selected from the group consisting of primary and secondary alcohol reducing agents, said primary alcohol reducing agent used in an amount of 0.9 to 1.3 mole primary alcohol reducing agent to each mole of o-nitroazobenzene and said secondary alcohol reducing agent used in an amount of 1.8 to 2.6 mole secondary alcohol reducing agent to each mole of o-nitroazobenzene, said reducing step carried out in the presence of an aromatic ketone catalyst, selected from the group consisting of benzanthrone and 9-fluorenone and a base to form said 2-phenylbenzotriazole by reaction of the compound of formula III with said alcohol reducing agent.

4,943,638

DYES SUITABLE FOR SENSITIZATION OF PHOTOCONDUCTIVE SYSTEMS

David E. Brown, St. Paul, and Louis M. Leichter, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 196,739, May 20, 1988, Pat. No. 4,853,310. This application Jul. 24, 1989, Ser. No. 383,977

Int. Cl.[5] C07D *209/02*

U.S. Cl. 548—455 **4 Claims**

1. A cyanine dye having at least 7 carbon atoms in a polymethine chain characterised in that it is in the form of a triiodide salt.

4,943,639

(S)-ALPHA-ETHYL-2-OXO-1-PYRROLIDINEACETAMIDE

Jean Gobert, Brussels; Jean-Pierre Geerts, Leglise, and Guy Bodson, Bellefontaine, all of Belgium, assignors to U C B Societe Anonyme, Brussels, Belgium

Division of Ser. No. 25,277, Mar. 12, 1987, Pat. No. 4,837,223, which is a division of Ser. No. 733,790, May 24, 1985, Pat. No. 4,696,943. This application Feb. 16, 1989, Ser. No. 311,631

Claims priority, application United Kingdom, May 15, 1984, 8412357

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[5] C07D *207/277*

U.S. Cl. 548—550 **2 Claims**

1. (S)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide substantially free of (R)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide.

2. (S)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide substantially free of (R)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide, prepared by the process which comprises reacting (S)-alpha-ethyl-2-oxo-1-pyrrolidineacetic acid successively with (1) an alkyl haloformate of the formula HalCOOZ in which Hal represents a halogen atom and Z represents an alkyl radical having 1 to 4 carbon atoms, and with (2) ammonia.

4,943,640

PREPARATION OF 5-(1-ALKYL-CARBONYLOXY)ALKYLPYRROLIDIN-2-ONE

Edmund P. Woo, and Michael J. Mullins, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 542,293, Oct. 14, 1983, abandoned. This application Mar. 18, 1988, Ser. No. 169,691

Int. Cl.[5] C07D *207/277*

U.S. Cl. 548—551 **19 Claims**

1. A process for the preparation of a 5-(1-alkylcarbonyloxy)alkylpyrrolidin-2-one which comprises contacting a N-alkylcarbonyl-5-alkylcarbonylpyrrolidin-2-one with hydrogen in the presence of a catalytic amount of a hydrogenation catalyst under conditions such that a 5-(1-alkylcarbonyloxy)alkylpyrrolidin-2-one is prepared.

4,943,641

3-AMINOAZETIDINE, ITS SALTS, PROCESS FOR THEIR PREPARATION AND INTERMEDIATES OF SYNTHESIS

Dino Nisato, Pavia, and Marco Frigerio, Mantova, both of Italy, assignors to Sanofi, Paris, France

Division of Ser. No. 703,828, Feb. 21, 1985, Pat. No. 4,822,895. This application Feb. 17, 1989, Ser. No. 311,868

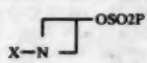
Claims priority, application France, Feb. 27, 1984, 84 02951

Int. Cl.[5] C07D *205/04*

U.S. Cl. 548—953 **7 Claims**

1. A process for the preparation of 3-aminoazetidine and its salts, which comprises:

(a) treating a 1-protected 3-sulfonyloxyazetidine, of formula



II

wherein R represents an alkyl group of from 1 to 4 carbon atoms, a phenyl group or a tolyl group and X represents the protecting group, with an alkali metal phthalimide;

(b) submitting the 1-protected 3-phthalimidoazetidine thus obtained to two subsequent reactions of hydrolysis with a 60–90% aqueous solution of hydrazine and of catalytic hydrogenation or, when the 1-protecting group is trityl, to two subsequent reactions of hydrolysis with a 60–90% aqueous solution of hydrazine and an acid hydrolysis under mild acid conditions;

(c) isolating the 3-aminoazetidine base thus obtained or converting the compound thus obtained into its addition salts with inorganic or organic acids.

4,943,642

HALO-OXYDIPHTHALIC ANHYDRIDES

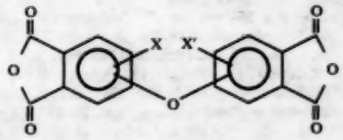
Jeffrey S. Stults, and Willis T. Schwartz, both of Grand Island, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed May 15, 1989, Ser. No. 352,070

Int. Cl.[5] C07D *307/89, 319/24*

U.S. Cl. 549—241 **7 Claims**

1. An oxydiphthalic anhydride compound of the formula



where X is F, Cl, Br, or I; X' is H, F, Cl, Br, or I.

4,943,643

MOLTEN SALT CATALYZED OXIDATION OF ALKANES OR OLEFINS USING LOWER TEMPERTURE NITRATE SALTS

B. Timothy Pennington, Sulphur, and Michael C. Fullington, Lake Charles, both of La., assignors to Olin Corporation, Cheshire, Conn.

Filed Jun. 7, 1989, Ser. No. 362,711
The portion of the term of this patent subsequent to Nov. 22, 2006, has been disclaimed.
Int. Cl.[5] C07D 301/06
U.S. Cl. 549—532 11 Claims

1. A process for producing an alkylene oxide comprising reacting an olefin having from 3 to 22 carbon atoms per molecule, or mixture thereof, with oxygen or an oxygen-containing gas, said olefin and said oxygen or oxygen-containing gas being gaseous reactants, by contacting said gaseous reactants with a bath, stream, spray or mist of at least one molten nitrate salt catalyst comprising lithium nitrate, said catalyst being present in an amount sufficient to absorb any heat generated during said reaction while maintaining an essentially constant reaction temperature, said reaction being conducted at a reaction temperature of between about 180° C. and about 250° C. and a reaction pressure of between about 1 and about 50 atmospheres to produce an alkylene oxide and a mixture of aldehyde by-products, the molar selectivity of said olefin to form said alkylene oxide being greater than about 50% and the molar selectivity of said olefin to form said aldehyde by-products being less than 16%.

4,943,644

OLEFIN AND ALKANE OXIDATIONS, RUTHENIUM CARBOXYLATE CATALYST THEREFOR AND METHOD OF PREPARATION THEREOF

Russell S. Drago, and Shannon Davis, both of Gainesville, Fla., assignors to The University of Florida, Gainesville, Fla.

Division of Ser. No. 147,302, Jan. 22, 1988, Pat. No. 4,885,377. This application Nov. 23, 1988, Ser. No. 274,837
Int. Cl.[5] C07D 301/06
U.S. Cl. 549—533 1 Claim

1. In a method of oxidizing olefins or alkanes wherein said olefin is contacted with oxygen in the presence of a catalyst for a time sufficient to oxidize said olefin or alkane, the improvement comprising conducting said oxidation in the presence of a catalyst consisting essentially of a complex of the formula:

$$Ru_3O[OCO(CF_2)_yCF_3]_6L_z^{x+}$$

wherein: Ru are reuthenium atoms having a formal oxidation state of +2 or +3,
L is a neutral or anionic ligand,
y is an integer from 0 to 6, and
x is an integer from 1 to 3; and an anion.

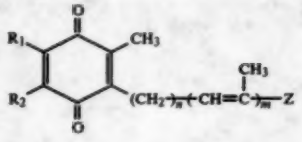
4,943,645

BENZOQUINONE DERIVATIVES AND PRODUCTION THEREOF

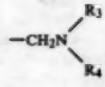
Shinji Terao, Toyonaka; Hisayoshi Okazaki, Kyoto, and Isuke Imada, Izumi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 268,495, Nov. 8, 1988, which is a division of Ser. No. 168,321, Mar. 18, 1988, Pat. No. 4,808,339, which is a division of Ser. No. 717,098, Mar. 28, 1988, Pat. No. 4,751,303, which is a division of Ser. No. 484,232, Apr. 12, 1983, Pat. No. 4,526,719. This application Aug. 8, 1989, Ser. No. 390,871
Claims priority, application Japan, Apr. 13, 1982, 57-62224
Int. Cl.[5] C07C 50/2, 50/38
U.S. Cl. 552—309 7 Claims

1. A compound of the formula



wherein R_1 and R_2 are the same or different and each is methyl or methoxy; n is an integer of 0 to 21; m is 0 or 1, and Z is a group of the formula:



wherein R_3 and R_4 are the same or different and each is hydrogen or an alkyl group which may optionally be substituted.

4,943,646

GALLIUM COMPLEXES AND SOLVENT EXTRACTION OF GALLIUM

James P. Coleman, Maryland Heights; Charles R. Graham, St. Charles, and Bruce F. Monzyk, Maryland Heights, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 937,849, Dec. 4, 1986. This application Nov. 23, 1987, Ser. No. 125,822
Int. Cl.[5] C07F 5/00
U.S. Cl. 556—1 7 Claims

1. A gallium (III) complex of N-alkyl alkanohydroxamic acid, wherein the alkano group has at least 8 carbon atoms, wherein said complex has a hydrocarbon solvent solubility of at least 2 percent by weight, wherein gallium can be stripped from said complex by a strong acid solution in the pH range of 1.2–1.6 and wherein said N-alkyl alkanohydroxamic acid is sufficiently stable in such acid solution that less than 1% of it is hydrolyzed during stripping of gallium.

4,943,647

PREPARATION OF HEXAALKYLDISILTHIANE

Elliot I. Band, North Tarrytown, N.Y., and Suzanne T. Eberhart, New Haven, Conn., assignors to Akzo America Inc., New York, N.Y.

Filed Mar. 30, 1989, Ser. No. 330,575
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—426 7 Claims

1. A process for preparing a product which is predominantly hexaalkyldisilthiane which comprises the reaction of dilithium sulfide and halotrialkylsilane in a non-oxygenated solvent.

4,943,648

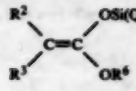
INITIATORS FOR GROUP TRANFER POLYMERIZATION

Ira B. Dicker, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 1, 1988, Ser. No. 176,807
Int. Cl.[5] C07F 7/08, 7/10, 7/18
U.S. Cl. 556—470 21 Claims

1. Process for preparing a silyl ketene acetal adduct, the process comprising contacting and reacting a silyl ketene acetal and an α,β-unsaturated compound in the presence of a mercury- or Lewis acid-containing catalyst,

A. the silyl ketene acetal being of the formula



wherein:

R^6 is

(a) a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphaticaromatic radical containing up to 20 carbon atoms;

(b) a polymeric radical containing at least 20 carbon atoms;

(c) a radical of (a) or (b) containing one or more ether oxygen atoms within aliphatic segments thereof; or

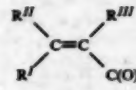
(d) a radical of (a), (b), or (c) containing one or more functional substituents that are unreactive under the process conditions;

each of R^2 and R^3 is independently selected from —H and hydrocarbyl, defined as for R^6 above, subparagraphs (a) to (d);

each Q^1, independently, is R^1 or OR^1;

each R^1, independently, is a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphatic-aromatic radical containing up to 20 carbon atoms or —H, provided that at least one R^1 group is not —H;

B. the α,β-unsaturated compound being of the formula



wherein:

each of R^I and R^{II}, independently, is as defined for R^2 and R^3 above;

R^{III} is $—CH_3$, —CN or $—CO_2R$;

X' is $—OSi(R^1)_3$, —R, —OR or $—NR'R''$;

R is

(a) a hydrocarbyl radical which is an aliphatic, alicyclic, aromatic or mixed aliphaticaromatic radical containing up to 20 carbon atoms;

(b) a polymeric radical containing at least 20 carbon atoms;

(c) a radical of (a) or (b) containing one or more ether oxygen atoms within aliphatic segments thereof;

(d) a radical of (a), (b) or (c) containing one or more functional substituents that are unreactive under the process conditions;

(e) a radical of (a), (b), (c) or (d) containing one or more reactive substituents of the formula $—O(O)C—C(Y^1)=CH_2$ wherein Y^1 is —H or $—CH_3$; or

(f) a radical of (a), (b), (c), (d), or (e) wherein at least some of the hydrogen atoms are replaced with fluorine atoms; and

each of R' and R'' is independently selected from C_{1-4} alkyl; and

C. the catalyst consists essentially of either:

(a) (i) about 0.5–100 mole % of a mercury compound selected from R^7HgI and $Hg(L)_2$ wherein:

R^7 is a hydrocarbyl radical of 1 to 10 carbon atoms; and

L is an anion; and

(ii) 0 to about 99.5 mole % of a silane of the formula $(R^1)_3SiZ^2$ wherein R^1 is defined as above and Z^2 is a weakly basic radical; or

(b) (i) about 0.5–90 mole % of a Lewis acid selected from zinc iodide, zinc chloride, zinc bromide, boron trifluoride, alkyl-aluminum oxide, alkyl-aluminum chloride, cadmium iodide, ferric chloride and stannous chloride; and

(ii) about 10–99.5 mole % of a silane of the formula $(R^1)_3SiZ^2$ wherein R^1 is defined as above and Z^2 is a weakly basic radical; provided, however:

(1) when the catalyst contains 100% of (a)(i), the mercury compound is selected from R^7HgI, HgI_2 and $Hg(ClO_4)_2$;

(2) when the catalyst is (a), at least one of L and Z^2 must be I; and

(3) when the catalyst is (a) and Z^2 is not I, L is I or ClO_4.

4,943,649

POLYOLS, USE AND METHOD OF PREPARATION

George Magnus, Arlington Heights, and Brian Kelley, Round Lake Beach, both of Ill., assignors to Polylactone, Inc., Milwaukee, Wis.

Filed Nov. 1, 1988, Ser. No. 266,471

Int. Cl.[5] C07H 3/10; C08B 11/145, 11/155; C08G 18/12

U.S. Cl. 536—124 30 Claims

1. A method of producing an alkoxylated polyol comprising:

(a) dispersing a urea reactant in a liquid dispersing media comprised of a polyether polyol, a polyester polyol and mixtures thereof and a chemical moiety capable of being alkoxylated and being characterized by at least the following characteristics:

(1) being selected from the group consisting essentially of carbohydrates, triazines, derivatives and sources thereof and mixtures thereof;

(2) being dispersible in said dispersing media at a temperature below about 130° C.; and

(3) having at least two reactive hydrogen atoms therein; and

(b) reacting the resultant dispersion with a C_2–C_6 epoxide under alkoxylation conditions for a period of time sufficient to obtain an alkoxylated polyol having a hydroxyl number below about 600.

4,943,650

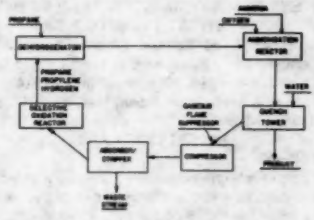
PROCESS FOR THE PRODUCTION OF NITRILES

Ramakrishnan Ramachandran, Allendale; Mark J. Andrecovich, Somerville; Donald L. MacLean, Annandale, and Donald P. Satchell, Jr., Summit, all of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Jan. 30, 1989, Ser. No. 304,055

Int. Cl.[5] C07C 253/24, 253/26, 253/34

U.S. Cl. 558—319 20 Claims



1. A process for the production of alpha, beta olefinically unsaturated nitriles comprising:

(a) forming an alkene from a gaseous alkane in a catalytic dehydrogenator;

(b) introducing a gaseous stream comprising said alkene, pure oxygen, air or a gas-enriched in oxygen relative to air and ammonia into a reactor and reacting them in the presence of a suitable catalyst to produce a gaseous effluent containing said nitrile or oxide;

(c) quenching said effluent in a liquid to form a liquid phase containing said nitrile or oxide and a gaseous phase;

(d) recovering said nitrile or oxide from said liquid phase;

(e) raising the pressure of the gaseous phase and introducing it into an absorber/stripper unit to thereby form a recycle gaseous stream comprising said unreacted alkane and alkene, a minor amount of oxygen and nitrogen when air

or oxygen-enriched air is introduced into the reactor in step (b), and a waste stream comprising the remainder of said gaseous effluent;

(f) introducing the recycle stream into a catalytic selective oxidation unit to remove the remaining oxygen in said stream; and

(g) introducing the recycle effluent from the selective oxidation unit into the dehydrogenator, wherein the nonflammability index of the waste stream formed in step (e), determined according to the expression

$$\text{Nonflammability Index} = \frac{\text{Percent Total Hydrocarbons}}{(\text{Pressure-psia})^{0.65}\,(\text{Percent Oxygen})^{1.94}}$$

is between about 0.005 and 10.0.

4,943,651

NOVEL SUBSTITUED NAPHTHALENE COMPOUNDS AND LIQUID CRYSTAL COMPOSITIONS CONTAINING SAME

Shinichi Nishiyama; Hideo Yamaoka; Tooru Yamanaka, and Tohru Yamada, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

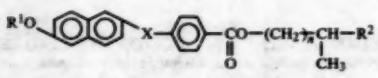
Filed Mar. 3, 1989, Ser. No. 318,560

Claims priority, application Japan, Mar. 7, 1988, 63-54430; Mar. 7, 1988, 63-54431

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—56 **4 Claims**

1. A substituted naphthalene compound having the following formula [I].



[I]

wherein R^1 represents alkyl of 1–18 carbon atoms, R^2 represents alkyl of 1–18 carbon atoms, X is a group represented by $—OCH_2—$ or $—CH_2CH_2—$, and n is 0 or 1.

4,943,652

PROCESS FOR ASYMMETRICALLY REDUCING CARBONYL COMPOUNDS

Masanobu Yatagai, and Takashi Ohnuki, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,514

Claims priority, application Japan, Nov. 11, 1987, 62-284987; Apr. 19, 1988, 63-95900

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—60 **9 Claims**

1. A process for asymmetrically reducing a ketone containing a heteroatom or atoms on at least one of the α- and β-carbon atoms of at least one of the two groups attached to the carbonyl group of the ketone, which comprises reducing the ketone by the use of a reducing agent comprising (i) an optically active tartaric acid or ester thereof and (ii) a metal borohydride, thereby producing an optically active alcohol.

4,943,653

NOVEL FLUORINE-CONTAINING ACRYLIC ACID DERIVATIVE AND POLYMER THEREOF

Shigeru Morita, Osaka, and Masahiko Oka, Shiga, both of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

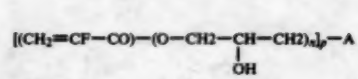
Continuation of Ser. No. 751,724, Jul. 3, 1985, abandoned. This application Feb. 26, 1987, Ser. No. 20,133

Claims priority, application Japan, Jul. 9, 1984, 59-142986

Int. Cl.[5] C07C *69/62*

U.S. Cl. 560—219 **8 Claims**

6. A fluorine-containing acrylic acid derivative of the formula:



wherein ρ is an integer corresponding to the valance of A, n is 0 or 1, and A is a residue derived by removing at least two active hydrogen atoms from a phenolic hydroxyl group.

4,943,654

PROCESS FOR PREPARATION OF α-ACETOXY-α-METHYL-N,N'-DIACETYL MALONAMIDE

Bernard Dubreux, Francheville Le Haut, and Charles Laviron, Lyons, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation of Ser. No. 728,446, May 1, 1985, abandoned, Continuation of Ser. No. 459,100, Jan. 19, 1983, abandoned. This application Jan. 15, 1986, Ser. No. 819,985

Claims priority, application France, Feb. 2, 1982, 82 01624

Int. Cl.[5] C07C *231/06, 235/88*

U.S. Cl. 560—251 **5 Claims**

1. A process for the preparation of α-acetoxy-α-methyl-N,N'-diacetylmalonamide in which hydrocyanic acid or cyanide is reacted with acetic anhydride in a first step and then the mixture so obtained is treated with acetic acid in the presence of an acid catalyst in the second step, wherein the first step is carried out with the acetic anhydride in the presence of an anion exchange resin catalyst, wherein the functional groups are the acetate form of quaternary ammonium or tertiary amine groups and the molar ratio of anhydride to hydrocyanic acid or cyanide is at least one.

4,943,655

SALT OF 5-ACETYL-2-ALKYLBENZENESULFONIC ACID

Kunioki Kato; Masao Kawamura, both of Akashi; Hiroshi Goda, Himeji; Kiyoshi Sawada, Hyogo, and Kazuhiro Hamatani, Kakogawa, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Japan

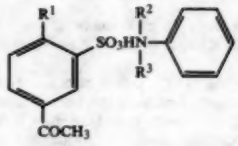
Division of Ser. No. 178,833, Mar. 25, 1988, Pat. No. 4,853,158, which is a continuation of Ser. No. 20,242, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 733,832, May 14, 1985, abandoned. This application Mar. 24, 1989, Ser. No. 328,388

Claims priority, application Japan, May 15, 1984, 59-98327; May 15, 1984, 59-98328; Sep. 18, 1984, 59-196470; Apr. 3, 1985, 60-71624

Int. Cl.[5] C07C *143/28, 143/38, 143.78*

U.S. Cl. 562—46 **2 Claims**

1. N,N-Dialkylaniline salt of 5-acetyl-2-alkylbenzenesulfonic acid represented by the general formula (5),



wherein R^1 is an alkyl group having 1 to 5 carbon atoms and R^2 and R^3 are the same or different and are each an alkyl group having 1 to 5 carbon atoms.

4,943,656

PROCESS FOR THE PRODUCTION OF POLYALKYLAROMATIC POLYSULFONIC ACIDS AND RECOVERY BY HEAVY PHASE SEPARATION

Lawrence V. Gallacher, East Norwalk, and Harry N. Condos, Stamford, both of Conn., assignors to King Industries, Inc., Norwalk, Conn.

Filed Jul. 19, 1984, Ser. No. 632,528
Int. Cl.[5] C07C 143/24
U.S. Cl. 562—90 40 Claims

1. A process for the production of a polyalkylaromatic polysulfonic acid comprising:

(a) agitating a mixture of at least one polyalkylaromatic compound, sulfuric acid and a water immiscible, inert diluent having a specific gravity of less than about 1.0;

(b) stratifying said mixture and withdrawing any spent acid layer therefrom;

(c) adding water to the remaining layer in an amount sufficient to form three layers, the bottom layer comprising substantially polyalkylaromatic polysulfonic acid and water; and

(d) separating said bottom layer.

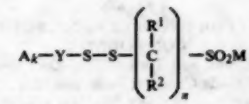
4,943,657

UNSYMMETRICAL ORGANIC DISULFIDE COMPOUNDS USEFUL AS ANTIRADIATION AGENTS

Lamar Field, Nashville, Tenn.; Hikmat A. Musallam, Damascus, Md.; Jeffrey D. Macke, Ft. Mitchell, Ky., and Pramod K. Srivastava, Varanasi, India, assignors to Vanderbilt University, Nashville, Tenn.

Division of Ser. No. 228,010, Aug. 3, 1988, Pat. No. 4,883,890, which is a division of Ser. No. 907,882, Sep. 16, 1986, abandoned. This application Jun. 14, 1989, Ser. No. 365,891
Int. Cl.[5] C07C 145/00
U.S. Cl. 562—125 2 Claims

1. The compound of the formula



wherein A is OH, k is an integer of one to two, Y is a straight chain alkyl having from two to eight carbon atoms which may have an S—S group interposed therebetween, R^1 and R^2 are hydrogen or cycloalkyl, n is an integer from two through five, M is hydrogen, alkali metal or a straight chain alkyl having up to four carbon atoms.

4,943,658

LIQUID OXIDATIVELY MODIFIED ETHYLENIC RANDOM COPOLYMER, PROCESS OF MAKING AND USE

Tatsuo Kinoshita, Yamaguchi; Shuji Minami, Hiroshima; Kinya Mizui, and Ryousuke Kaneshige, both of Chiba, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 173,102
Claims priority, application Japan, Mar. 26, 1987, 62-70216
Int. Cl.[5] C07C 27/10
U.S. Cl. 562—572.2 14 Claims

1. A liquid oxidatively modified ethylenic random copolymer, which is an oxidatively modified product of a liquid ethylenic random copolymer comprising 20 to 80 mol % of ethylene and 80 to 20 mol % of α-olefin, and having

(i) a number average molecular weight (Mn) in the range of from 200 to 10,000 as measured by a vapor pressure osmometer(VPO),

(ii) a molecular weight distribution ($\overline{M}w/\overline{M}n$) given as weight average molecular weight ($\overline{M}w$) divided by number average molecular weight ($\overline{M}n$) in the range of up to 4 as measured by gel permeation chromatography, and

(iii) an oxygen content in the range of from 0.1 to 20 % by weight, an acid value in the range of from 0.1 to 50, and a saponification value in the range of from 0.1 to 100.

4,943,659

PROCESS FOR PREPARATION OF ALPHA, BETA-UNSATURATED ACIDS

Gary P. Hagen, Glen Ellyn, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 785,326, Oct. 7, 1985, abandoned, which is a continuation of Ser. No. 632,018, Jul. 18, 1984, abandoned, which is a continuation of Ser. No. 412,914, Aug. 30, 1982, abandoned. This application Dec. 29, 1986, Ser. No. 946,986
Int. Cl.[5] C07C 51/353, 57/04, 57/26, 57/42
U.S. Cl. 562—599 18 Claims

1. A process for preparation of alpha, beta-unsaturated acids by reaction at a temperature within the range from about 250° C. to 400° C. between formaldehyde and a carboxylic acid of formula RCH_2COOH wherein R is selected from the class consisting of —H, -alkyl, -aryl, -aralkyl, and -cycloalkyl radicals in the presence of a catalyst composition comprising a Group IA alkali metla component and a silica component, wherein said Group IA alkaly metla component is present in an amount in the range from about 200 parts per million to about 15,000 parts per million by weight measured as sodium or sodium mol equivalents, and wherein said silica component is prepared by precipitating a colloidal silica from aqueous solution in the presence of hydrogen ions and thereupon dried, crushed, and calcined such that said silica component has a surface area of 50–500 m^2/g, a pore volume of 0.5–3.5 cc/g and average pore diameter of 80–600 Å, and contains between zero and about 500 parts per million by weight individually of aluminum, zirconium, titanium, or iron.

4,943,660

PROCESS FOR THE PRODUCTION OF THIOCARBOHYDRAZIDE

Dennis E. Jackman, Prairie Village, Kans.; Gary W. Combs, Blue Springs, Mo., and Dietmar B. Westphal, Remscheid, Fed. Rep. of Germany, assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1989, Ser. No. 324,836
The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.
Int. Cl.[5] C07C 337/06
U.S. Cl. 564—18 8 Claims

1. A process for the production of TCH comprising reacting hydrazine and carbon disulfide in the presence of a mercaptan or a mercaptan-forming compound at a temperature of from 20° to 85° C.

4,943,661

PROCESS FOR PREPARING THIOUREA DIOXIDE DERIVATIVES

Hirohisa Nitoh; Osami Ohura, and Morio Suzuki, all of Shizuoka, Japan, assignors to Tokai Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1989, Ser. No. 323,495
Claims priority, application Japan, Sep. 30, 1988, 63-243896
Int. Cl.[5] C07C 335/08, 335/12, 335/16
U.S. Cl. 564—26 5 Claims

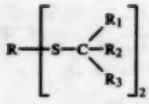
1. A process for preparing an amine-substituted thiourea dioxide, comprising reacting thiourea dioxide and an aliphatic or aromatic primary amine in a neutral or acidic pH range.

4,943,662
PROCESS FOR PREPARATION OF DITHIOLS

Emmanuel Arretz, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Dec. 22, 1988, Ser. No. 288,438
Claims priority, application France, Feb. 17, 1988, 88 01881
Int. Cl.[5] C07C 148/00
U.S. Cl. 568—66 20 Claims

1. A process for the preparation of dithiols comprising reacting hydrogen sulphide in the presence of a solid acid catalyst with a di-(tertiary-alkylthio) alkane of general formula:



(I)

in which R is an alkylene radical having 5 to 20 carbon atoms, and the symbols R_1, R_2 and R_3 are identical or different and are each an alkyl radical having 1 to 15 carbon atoms and wherein the reaction temperature is within the range of ambient temperature to 250° C.

4,943,663
PROCESS FOR THE PREPARATION OF α-ALKYLACROLEINS

Gerhard Diekhaus, and Harald Kappesser, both of Oberhausen, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 22, 1988, Ser. No. 274,829
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740293
Int. Cl.[5] C07C 45/00
U.S. Cl. 568—461 19 Claims

1. A process for the preparation of alpha-alkylacrolein comprising a reaction of formaldehyde with a starting aldehyde of the formula

wherein R is a straight or branched chain alkyl having 1 to 10 carbon atoms, in the presence of, per mol of said starting aldehyde, 0.02 to 0.05 moles of at least one secondary amine selected from the group consisting of dipropylamine, methylbutylamine, ethylbutylamine, di-n-butylamine and di-n-octylamine and;

a total of 0.02 to 0.065 moles of a carboxylic acid having 1 to 5 carbon atoms, at a temperature of 70° to 120° C. and under a pressure of 0.2 to 1.0 MPa, the molar ratio of said amine to said acid being 1:0.8 to 1:1.3,

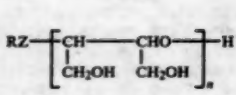
carrying out said reaction in a first step in a mixture of said formaldehyde, said starting aldehyde, said amine, and 25 to 75 mol % of said total of said acid and, as a second stage, adding the rest of said acid to said mixture to complete said reaction.

4,943,664
SURFACTANT PRODUCTS CONTAINING 1,3,4-BUTANETRIOL

Lowell R. Anderson, Morristown; Mohamed M. Hashem, Wayne, and Robert B. Login, Oakland, all of N.J., assignors to GAF Chemicals Corporation, Princeton, N.J.

Filed Sep. 22, 1989, Ser. No. 410,783
Int. Cl.[5] C07C 43/10
U.S. Cl. 568—623 3 Claims

1. A surfactant product having the formula:



where

R is C_8–C_{24} alkyl;

Z is —O—; and

n is greater than 1 and up to 4,

which is prepared by reaction of 2,3-epoxy-1,4-butanediol with ROM, where M is an alkali metal.

4,943,665
MODIFIED BISPHENOLS CONTAINING ARYLCYCLOBUTENEALKYL ETHERS AND CURED COMPOSITIONS THEREFROM

Pui-Kwan Wong, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 9, 1989, Ser. No. 349,546
Int. Cl.[5] C08G 59/00
U.S. Cl. 568—633 18 Claims

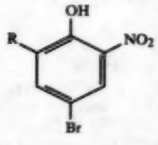
1. A di(arylcyclobutenealkyl) ether of a di(hydroxyphenyl) compound of up to 30 carbon atoms and from 1 to 2 aromatic rings, inclusive.

4,943,666
PROCESS FOR PRODUCING NITROPHENOL COMPOUND

Taiiti Okada, Kyoto, and Toru Ishida, Kobe, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

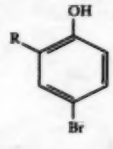
Filed Apr. 14, 1989, Ser. No. 337,886
Claims priority, application Japan, Apr. 27, 1988, 63-106147
Int. Cl.[5] C07C 79/32, 79/02
U.S. Cl. 568—709 7 Claims

1. A process for producing a compound of the formula:



(II)

wherein R is an alkyl group having 1 to 4 carbon atoms which comprises reacting a compound of the formula:



(I)

wherein R is as defined above with nitrous acid at −10° to 100° C. in a mixed solvent of water and a water-insoluble or slightly soluble organic solvent having a water solubility of not more than 10% by weight.

4,943,667

PREPARATION OF PHENYLETHANOLS

Wolfgang Hoelderich, Frankenthal; Norbert Goetz, Worms, and Leopold Hupfer, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

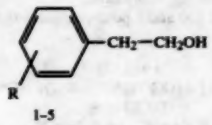
Filed Jan. 13, 1989, Ser. No. 296,766

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1988, 3801106

Int. Cl.[5] C07C 29/15, 29/132

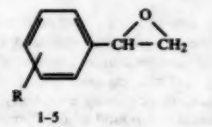
U.S. Cl. 568—814 8 Claims

1. A process for preparing a phenylethanol of the formula (I)



(I)

where R is hydrogen, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms-, fluorine, trifluoromethyl or trifluoromethoxy, which consisting essentially of reacting an epoxy of formula (II)



(II)

where R is as defined above, in the gas phase at from 100° to 500° in the presence of hydrogen over a zeolite or phosphate doped with a hydrogenating metal as a catalyst.

4,943,668

ALKYLATION OF META-XYLENE WITH ALPHA-OLEFINS

Michael S. Matson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 29, 1988, Ser. No. 237,818

Int. Cl.[5] C07C 2/66, 2/70

U.S. Cl. 585—456 29 Claims

1. A process for producing an alkylated aromatic product consisting essentially of a C_{13}–C_{20} mono-alkylated meta-xylene wherein the 1,3,5 isomer predominates the 1,2,4 isomer, said process comprising gradually adding a C_{13} to C_{20} α-olefinic compound to a mixture of meta-xylene and a catalyst system while allowing the reaction temperature to rise to a level in the range of about 40° C. to about 80° C., then maintaining a reaction temperature in the range of 40° C. to about 80° C. for a suitable period of time after the addition of the olefinic compound has been completed, wherein said catalyst system comprises elemental iodine and AlX_3 wherein each X is independently selected from the halogens.

4,943,669

METHOD ACCORDING TO THE INVENTION IS NOTABLY APPLIED TO THE SELECTIVE DIMERIZATION OF PROPYLENE INTO METHYL-4-PENTENE-1

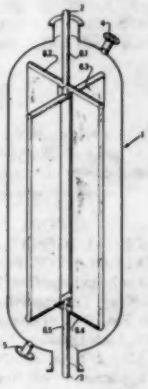
Quang Dang Vu, Neuilly, and Yves Chauvin, Le Pecq, both of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Jun. 23, 1989, Ser. No. 370,530

Claims priority, application France, Jun. 24, 1988, 88 08633

Int. Cl.[5] C07C 2/00, 2/08

U.S. Cl. 585—503 6 Claims



1. A catalytic method for dimerizing or codimerizing or oligomerizing olefins, carried out under pressure, in the presence of a solid catalyst, in a reaction zone defined by a substantially cylindrical enclosure whose section is substantially circular, said enclosure containing a catalyst bed in which a plurality of hollow internal spaces having a substantially parallelepipedic shape is disposed, through which flows a thermoregulation fluid, at a pressure substantially equal to the pressure to which the reaction mixture is subjected, in which method:

a fresh liquid charge, containing at least one olefin, mixed with a recycled charge defined below, is introduced into said hollow internal spaces defined by walls, the weight ratio between the recycled charge and the fresh charge being between 1 and 500, the fresh charge-recycled charge mixture forming the thermoregulation fluid;

the thermoregulation fluid is drawn off from said internal spaces and this fluid is separated into two portions called hereafter recycled charge and make-up charge, the weight ratio between said recycled charge and said make-up charge being between 1 and 500;

said recycled charge is fed into said internal spaces as a thermoregulation fluid component;

said make-up charge is fed into said catalyst bed; and

a reaction effluent is drawn off from said catalyst bed.

4,943,670

PREPARATION OF CONJUGATED DIENES

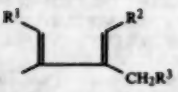
Brian L. Goodall, Akron, Ohio; Willem Terlouw, and Jacob C. van der Sar, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 22, 1989, Ser. No. 441,124

Int. Cl.[5] C07C 2/76, 1/20

U.S. Cl. 585—601 15 Claims

1. A process for the preparation of a compound of general formula



(I)

in which R^1 represents a hydrogen atom or a methyl group, one of R^2 and R^3 represents a hydrogen atom and the other of R^2 and R^3 is the same as R^1, which process comprises reacting a compound of general formula

$$R^1CH{=}C{=}CH_2 \qquad (II)$$

with a salt of formic acid in the presence of a catalyst system comprising a palladium salt and a phosphorus compound of general formula

$$P(OX)_n(X)_{3-n} \qquad (III)$$

in which n is 0, 1, 2, or 3 and each X independently represents an alkyl, alkenyl, aryl, aralkyl, alkaryl or cycloalkyl group, and recovering the desired compound of formula (I).

4,943,671

REDUCTIVE DEHALOGENATION OF ORGANIC HALOGEN COMPOUNDS

Toni Dockner, Meckenheim; Manfred Sauerwald, Roedersheim-Gronau; Herbert Krug, Ludwigshafen, and Matthias Irgang, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 2, 1988, Ser. No. 189,362

Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715751

Int. Cl.[5] C07C *1/00, 1/30*

U.S. Cl. 585—642 **14 Claims**

1. A process for the reductive dehalogenation of an organic halogen compound in which one or more halogen atoms selected from the group containing of iodine, bromine and chlorine are covalently bonded to the carbon, which process comprises:

reacting said organic halogen compound with a hydrocarbon in the presence of carbon at a temperature of from 100° to 450° C. for dehalogenation with formation of a hydrogen halide, and carrying out the dehalogenation in the presence of iron powder or an iron compound as a cocatalyst.

4,943,672

PROCESS FOR THE HYDROISOMERIZATION OF FISCHER-TROPSCH WAX TO PRODUCE LUBRICATING OIL (OP-3403)

Glen P. Hamner, deceased, late of Baton Rouge, La. (by Annabelle Hamner, executrix); Heather A. Boucher, Point Edward, Canada, and William A. Wachter, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 134,797, Dec. 18, 1987, abandoned. This application Dec. 13, 1988, Ser. No. 283,643

Int. Cl.[5] C07C *5/13*

U.S. Cl. 585—737 **14 Claims**

1. A process for producing a lubricating oil having a high viscosity index and a low pour point from a Fischer-Tropsch wax, which process comprises:

(a) contacting the Fischer-Tropsch wax with hydrogen and a hydrotreating catalyst comprising Co, Ni, Mo or W or any mixture of two or more of said metals to reduce the oxygenate and trace metal levels of the wax and to partially hydrocrack and isomerize the wax;

(b) contacting the hydrotreated Fischer-Tropsch wax from step (a) with hydrogen in a hydrosiomerization zone in the presence of a fluorided Group VIII metal-on-alumina catalyst having (i) a bulk fluoride concentration ranging from about 2 to about 10 weight percent, wherein the fluoride concentration is less than about 3.0 weight percent at the outer surface layer to a depth less than one one hundredth of an inch, provided the surface fluoride concentration is less than a bulk fluoride concentration, (ii) an aluminum fluoride hydroxide hydrate level greater than 60 where an aluminum fluoride hydrate level of 100 corresponds to the X-ray diffraction peak height of 5.66Å for a Reference Standard, and (iii) a N/Al ratio less than about 0.005;

(c) fractionating the effluent from step (b) to produce a lubricating oil fraction boiling above about 640° F. at atmospheric pressure; and

(d) dewaxing the lubricating oil fraction from step (c) to produce a dewaxed lubricating oil having a viscosity index of at least 130 and a pour point less than about 0° F.

4,943,673

NOVEL METAL-DIKETONE ABSORBENTS FOR OLEFINS

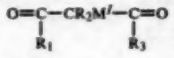
John A. T. Norman, Whitehall, and Robert E. Stevens, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 167,605, Mar. 14, 1988, Pat. No. 4,845,254, which is a division of Ser. No. 83,742, Aug. 7, 1987, abandoned. This application Oct. 17, 1988, Ser. No. 258,737

Int. Cl.[5] C07C *7/11*

U.S. Cl. 585—845 **9 Claims**

1. A process for removing an unsaturated hydrocarbon containing at least one non-aromatic unsaturated bond from a feedstream containing said unsaturated hydrocarbon and saturated hydrocarbons, said process comprising contacting said feedstream with a mixture consisting essentially of an organic solvent or diluent and a compound of the formula:



wherein R_1 is trichloromethyl or R_F; R_F is C_nF_{2n+1} and n is 1–8; R_2 is H or hydrocarbyl of 2–20 carbon atoms having at least one olefinic unsaturated bond; R_3 is hydrocarbyl of 2–20 carbon atoms having at least one olefinic unsaturated bond and M^I is Cu^I or Ag^I, whereby said compound selectively absorbs the unsaturated hydrocarbon.

4,943,674

FRUIT SPECIFIC TRANSCRIPTIONAL FACTORS

Catherine M. Houck, Vacaville, and Julie R. Pear, Davis, both of Calif., assignors to Calgene, Inc., Davis, Calif.

Filed May 26, 1987, Ser. No. 54,369

Int. Cl.[5] A01H *1/04*; C12N *15/00, 5/00*; C07H *15/12*

U.S. Cl. 800—205 **14 Claims**

13. A tomato plant comprising:

a DNA construct comprising in the direction of transcription, a tomato 2A11 transcriptional initiation region joined to a DNA sequence of interest, wherein said DNA sequence is other than the wild-type sequence and is under the transcriptional regulation of said 2A11 initiation region, and a transcriptional termination region.

4,943,675

ANILINOPYRIMIDINE DERIVATIVES

Takahiro Kimoto, Fuji; Hideo Ohi, Shizuoka; Toshihisa Watanabe, Fuji, and Tadashi Nakayama, Shizuoka, all of Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1989, Ser. No. 366,459

Claims priority, application Japan, Jun. 24, 1988, 63-156069

Int. Cl.[5] C07D *239/00, 239/42*

U.S. Cl. 544—330 **2 Claims**

1. The compound, 2-anilino-4-methyl-6-acetonylpyrimidine.

2. The compound, 2-anilino-4-methyl-6-(2-chloropropen-1-yl)pyrimidine.

4,943,676

THERMOLYSIS OF POLY(N-VINYLFORMAMIDE) TO POLY(N-VINYLAMINE)

Robert K. Pinschmidt, Jr., Allentown, Pa., and Ta-Wang Lai, Novato, Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 12, 1989, Ser. No. 378,731
Int. Cl.[5] C08F 8/12
U.S. Cl. 525—383 **6 Claims**

1. In a method for preparing a vinylamine-containing polymer from a vinylamide-containing polymer, the improvement which comprises heating a vinylformamide-containing polymer in the absence of a base or an acid to a temperature sufficient to effect thermodecarbonylation.

4,943,677

MAKING POLY(ALKYLENE CARBONATES) OF CONTROLLED MOLECULAR WEIGHT

Andrzej Rokicki, Alburtis, Pa., assignor to Air Products and Chemicals, Inc., Allentown; Arco Chemical Company, Newtown Square, both of, Pa. and Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jun. 8, 1989, Ser. No. 363,579
Int. Cl.[5] C08G 64/02, 64/34
U.S. Cl. 528—405 **14 Claims**

1. A process for making a poly(alkylene carbonate) having a desired molecular weight which comprises contacting under copolymerization conditions carbon dioxide and one or more oxirane compounds in the presence of a catalytic amount of a zinc polycarboxylate catalyst and an amount of sterically hindered organic proton donor sufficient to reduce the molecular weight of the poly(alkylene carbonate) from that which would have been formed without said proton donor being present, but insufficient to reduce significantly the productivity of said catalyst over the course of the reaction, said proton donor having an acidity of 3 to 20 pK_a and a steric parameter (E_s) of −0.38 or less.

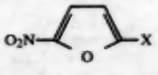
4,943,678

PESTICIDAL COMPOSITION

Sandor Angyan, Budaors; Gyula Oros; Istvan Racz, both of Budapest, and Tamas Detre, Nagymaros, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt, Budapest, Hungary

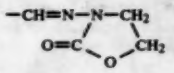
Filed Jun. 25, 1985, Ser. No. 748,740
Claims priority, application Hungary, Jun. 25, 1984, 2454/84
Int. Cl.[5] A01N 43/82, 43/76
U.S. Cl. 514—374 **6 Claims**

1. A method of combating phytopathogenic bacteria selected from the group consisting of Agrobacteria, Erwinia, Xanthomonas, Pseudomonas, and Corynebacterium, which comprises the step of applying onto a plant, the soil, or the environment thereof, an antibacterial composition, comprising a phytopathogenic bactericidally effective amount of the compound of the Formula (I)



wherein X is the group of the Formula (a)

or the Formula (b)



in combination with an agriculturally acceptable inert carrier.

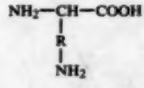
4,943,679

PROCESS FOR THE N-ω-TRIFLUOROACETYLATION OF SATURATED ALIPHATIC MONOCARBOXYLIC α,ω-DIAMINO ACIDS

Paul Aviron-Violet, Saint-Genis, and Christian Gervais, Villeurbanne, both of France, assignors to Rhone Poulenc Chimie, Courbevoie, France

Filed Jan. 25, 1988, Ser. No. 147,531
Claims priority, application France, Jan. 26, 1987, 87 01031
Int. Cl.[5] C07C 103/48
U.S. Cl. 562—561 **16 Claims**

1. A process for the for the N-ω-trifluoroacetylation of a saturated aliphatic monocarboxylic α,ω-diamino acid, comprising the step of contacting in an alcoholic medium a saturated aliphatic monocarboxylic α,ω-diamino acid of the formula:



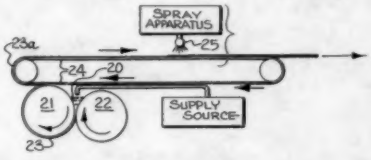
wherein R represents a straight-chain or branched-chain C_1–C_6 alkylene radical, with a C_1–C_4 straight-chain or branched-chain alkyl trifluoroacetate in the absence of a base for a time sufficient to N-ω-trifluoroacetylate said α,ω-diamino acid.

4,943,680

METHOD OF MAKING A DECORATIVE SHEET MATERIAL SIMULATING THE APPEARANCE OF A BASE COAT/CLEAR COAT PAINT FINISH

Thomas M. Ellison, and Robert A. Winton, both of Charlotte, N.C., assignors to Rexham Corporation, New York, N.Y.

Division of Ser. No. 241,856, Sep. 18, 1988, which is a continuation-in-part of Ser. No. 924,299, Oct. 28, 1986, Pat. No. 4,810,540. This application Jan. 8, 1990, Ser. No. 461,662
Int. Cl.[5] B05D 3/02; B65B 33/00
U.S. Cl. 427—154 **10 Claims**



4. A method for making a flexible decorative sheet material for use in surfacing automobile body panels and the like, said sheet material being characterized by having the appearance of

a glossy, base coat/clear coat automotive paint finish, and comprising the steps of

(a) casting onto a smooth surfaced carrier an optically clear weatherable liquid polymer,

(b) hardening the liquid polymer to form a flexible, optically clear film on the carrier having a smooth surface in contact with the carrier with a distinctness of image value of 65 percent or greater,

(c) applying to the exposed surface of the thus formed film a thin coating of a flexible polymer with pigments distributed therein, and drying the thin coating to thereby form a flexible decorative sheet material having the appearance of a glossy base coat/clear coat automotive paint finish when viewing the outer surface thereof, and

(d) removing said coated film from said carrier to expose the glossy smooth outer surface thereof.

4,943,681

OPTICAL RECORDING MEDIUM AND PROCESS FOR THE PRODUCTION THEREOF

Takeshi Sato; Shuji Miyazaki; Makoto Sakamoto, and Motonori Ando, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

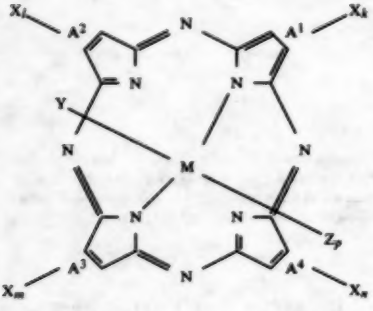
Filed Dec. 22, 1989, Ser. No. 454,953

Int. Cl.[5] G03C 1/72

U.S. Cl. 430—495 **18 Claims**

1. An optical recording medium which comprises an organic thin film layer containing at least one of phthalocyanine compounds represented by the following general formula (I)

General formula (I)

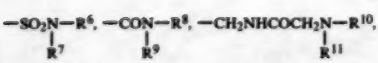


wherein

rings A^1 to A^4 each independently represent a benzene ring, naphthalene ring or anthracene ring,

M represents Al, Ga, In, Si, Ge or Sn,

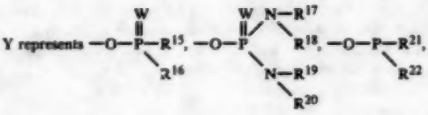
X's may be identical or different, and each represents an alkyl group which may have a substituent, an aryl group which may have a substituent, a heteroring moiety which may have a substituent, a phthalimidomethyl group which may have a substituent, a halogen atom, a nitro group, a cyano group, a sulfonic acid group, $-OR^1$, $-SR^2$, $-COOR^3$,



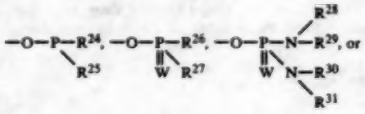
$-NHCOR^{12}$, $-N{=}NR^{13}$, or $-N{=}CHR^{14}$,

in which

R^1 to R^{11} may be identical or different, and each represents a hydrogen atom, an alkyl group which may have a substituent, an aryl group which may have a substituent, an acyl group which may have a substituent, a cycloalkyl group which may have a substituent, or a polyether group which may have a substituent, or R^6 and R^7, R^8 and R^9 or R^{10} and R^{11} may form a four to seven-membered heteroring, and these four to seven-membered ring may further contain a nitrogen atom, oxygen atom or sulfur atom, and R^{12}, R^{13} and R^{14} may be identical or different, and each represents an alkyl group which may have a substituent, a cylcoalky group which may have a substituent, or an aryl group which may have a substituent,



—O—Se—R^{23}, and Z represents hydrogen, a halogen atom, a hydroxyl group, an alkyl group which may have a substitutent,



in which R^{15}, R^{16}, R^{21}, R^{22}, R^{23}, R^{24}, R^{25}, R^{26}, R^{27} and R^{32} may be identical or different, and each represents an alkyl group which may have a substituent, an aryl group which may have a substituent, an acyl group which may have a substituent, a cycloalkyl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, a polyether group which may have a substituent, a hydroxyl group, or a halogen atom, and in which R^{17}, R^{18}, R^{19}, R^{20}, R^{28}, R^{29}, R^{30} and R^{31} may be identical or different, and each represents an alkyl group which may have a substituent, an aryl group which may have a substituent, an acyl group which may have a substituent, a cycloalkyl group which may have a substituent, an alkoxy group which may have a substituent, an aryloxy group which may have a substituent, a polyether group which may have a substituent, a hydroxyl group, a halogen atom or a hydrogen atom, and W represents O, S, Se or Te,

k, l, m and n each independently represent an integer of 0 to 8, and

p represents 0 or 1.

4,943,682

PRODUCTION OF PARTICULATE POLYIMIDE POLYMERS

W. Dirk Klobucar; Allan A. Eisenbraun, and Ronald C. Zumstein, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 15, 1988, Ser. No. 284,674

Int. Cl.[5] C08G 69/26

U.S. Cl. 528—353 **29 Claims**

1. A process for the production, in particulate form, of aromatic polyimides derived from a 2,2-bis[4-(aminophenoxy)-phenyl]-hexafluoropropane as the sole or predominant aromatic primary diamine component thereof, which process comprises forming, heating and agitating in a medium composed of dipolar aprotic solvent and liquid aromatic hydrocar-

bon solvent, a homogeneous solution of a polyamic acid derived from a substantially equimolar mixture of (i) an aromatic tetracarboxylic dianhydride and (ii) a 2,2-bis[4-(aminophenoxy)phenyl]hexafluoropropane such that (a) said solution contains at least 50 percent by weight of the liquid aromatic hydrocarbon based on total solution, and (b) a separate phase of particulate aromatic polyimide is formed in said medium.

4,943,683

ANOMALY DIAGNOSIS SYSTEM FOR A NUCLEAR REACTOR CORE

Kazuhiro Utsunomiya; Nobumi Ooyama, and Hideo Sakaba, all of Ibaraki, Japan, assignors to Power Reactor and Nuclear Fuel Development Corporation, Tokyo, Japan

Filed Aug. 11, 1988, Ser. No. 231,088
Claims priority, application Japan, Aug. 17, 1987, 62-203070
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—245 6 Claims

1. In combination, a nuclear reactor having a reactor core with at least one fuel assembly, and an anomaly diagnosis system, said system comprising:

at least one anomaly detecting means including an oscillating circuit and responsive to a radio wave for generating an echo signal which varies in response to an anomaly in the nuclear reactor core, said anomaly detecting means including sensors for sensing the condition of the nuclear reactor core, said anomaly detecting means being incorporated into said fuel assembly; and

a transmitter-receiver means for transmitting said radio wave to the anomaly detecting means to make the anomaly detecting means generate the echo signal and for receiving the echo signal generated by the anomaly detecting means, said transmitter-receiver means including means for examining the echo signal, and means for determining that an anomaly has occurred in the nuclear reactor core and for giving an anomaly detection signal to a plant protection system upon the detection of a deviation of the echo signal from a reference signal mode.

4,943,684

CERAMIC ARTICLE, PROCESS FOR IMPRINTING CERAMIC ARTICLES AND APPARATUS

Karl H. Kramer, South Bellmore, N.Y., assignor to First Eastern Equities, Inc., Ontario, Canada

Continuation of Ser. No. 175,648, Mar. 21, 1988, abandoned, which is a continuation of Ser. No. 25,701, Mar. 13, 1987, abandoned. This application Aug. 8, 1989, Ser. No. 391,649
Int. Cl.[5] B65D *25/34*; B41M *3/12*
U.S. Cl. 428—34.4 8 Claims

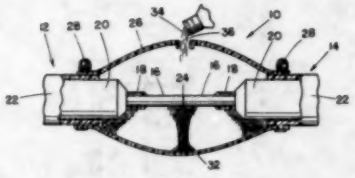
1. A ceramic article having a substantially cylindrical shape and a protruding handle member, the article having at least one curved surface for receiving a sublimation heat transfer image, said curved surface being coated to a predetermined thickness with a polymeric coating, said coating being capable of permanently bonding with the ceramic article and being substantive to sublimation heat transfer dyes.

4,943,685

CABLE SPLICING AND TERMINATION SYSTEM

Edward A. Reynaert, Sanford, Mich., assignor to Commu-Tec, Inc., Marion, N.C.

Filed Mar. 17, 1989, Ser. No. 324,699
Int. Cl.[5] H02G 15/22, 15/24
U.S. Cl. 174—19 8 Claims



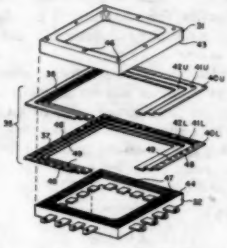
1. A cable system comprising: at least one conductor, means for environmentally protecting a portion of said conductor including a housing enclosing said portion of said conductor to be protected and defining a space within said housing around said conductor, and a gel substantially completely filling said space, said gel being formed of an imbibitive lightly cross-linked polymer having a fluid entrapped in the polymer network thereof, said polymer being an alkylstyrene polymer.

4,943,686

SEAL FRAME AND METHOD OF USE

Andrzej Kucharek, 555 W. Middlefield Rd., Suite A 310, Mountain View, Calif. 94043

Filed Apr. 18, 1988, Ser. No. 182,626
Int. Cl.[5] H05K 5/06
U.S. Cl. 174—52 F 2 Claims



1. A sealed assembly, comprising:

(a) a first body having a surface;

(b) a second body having a surface for mating with the first body surface;

(c) a sealing frame arrangement for sealing the first body surface to the mating second body surface, comprising first and second frames having outer surfaces of configuration matched to the configuration of, respectively, the first and second body surfaces, and having mating facing inner surfaces;

said first frame being sealed to the first body surface at a first location defined along the outer surface of said first frame; the second frame being sealed to the second body surface at a second location defined along the outer surface thereof of said second frame; and the first and second frames being sealed at a third location defined along the facing inner surfaces thereof;

said frames extending outside the first and second body surfaces such that the third seal is spaced from the first and second body surfaces thereby defining a first space for severing said frames inside the third seal and for resealing the frame inside said severed location; and

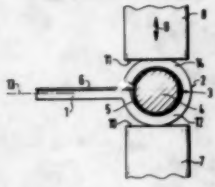
wherein the frames are of stepped configuration and the third seal is formed in mating steps thereof.

4,943,687

CURRENT COLLECTING UNIT

Franz Armbruster; Carsten Bauer, both of Stuttgart, and Friedhelm Meyer, Illingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 23, 1988, Ser. No. 289,199
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 8800341[U]
Int. Cl.[5] H01R 4/02
U.S. Cl. 174—94 R 8 Claims



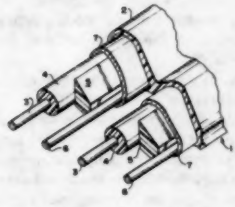
1. A current collecting unit, comprising a current collecting rail having a longitudinal axis and provided with a sleeve having an inner surface; a connecting member mounted in said sleeve, said sleeve having one curved portion located above said longitudinal axis and another curved portion located below said longitudinal axis and forming electrode supports, said rail and said connecting member being formed of materials having a predetermined melting temperature; a metal coating provided on said inner surface of said sleeve and having a melting temperature which is lower than the melting temperature of said rail and said connecting member, so that during welding of said sleeve with said connecting member by applying pressure and heat said portions of said sleeve are compressed and said portions of said sleeve obtain flattenings which transfer the pressure and heat to said connecting member, and said metal coating becomes melt flowable so that available gaps between said sleeve and said connecting member are filled with said metal coating.

4,943,688

RIBBON COAXIAL CABLE WITH OFFSET DRAIN WIRES

Herbert VanDeusen, Bear, and John A. Voltz, Newark, both of Del., assignors to W. L. Gore & Assocites, Inc., Newark, Del.

Filed Nov. 4, 1988, Ser. No. 267,140
Int. Cl.[5] H01B 7/18
U.S. Cl. 174—103 9 Claims



1. A ribbon coaxial cable comprising:

(a) a plurality of elongated and conductive center conductors;

(b) a plurality of elongated and insulative spacers parallel with said center conductors;

(c) a plurality of elongated and conductive drain conductors

parallel with said insulative spacers and said center conductors and arranged such that a drain conductor is adjacent each center conductor and a spacer is located between each center conductor and its drain conductor, each center conductor being surrounded concentrically by a separate layer of dielectric insulation, each center conductor and its adjacent associated spacer and drain conductor surrounded as a unit by a conductive outer shielding in contact with said drain conductor; and

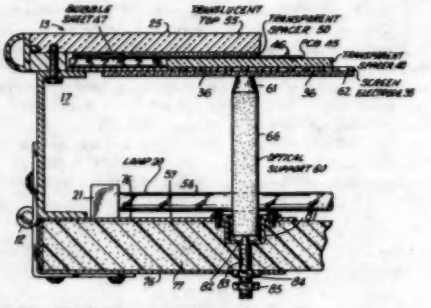
(d) a thermoplastic outer dielectric jacket surrounding said outer conductive shielding, said center conductors, said spacers, and said drain conductors to hold said center conductors and said drain conductors in mutually evenly spaced-apart parallel configuration.

4,943,689

BACKLIT DIGITIZER TABLET

David A. Siefer, Orange, and Alexander M. Purcell, Guilford, both of Conn., assignors to Summagraphics Corporation, Seymour, Conn.

Filed Jun. 23, 1989, Ser. No. 370,913
Int. Cl.[5] G08C 21/00; G09F 13/04
U.S. Cl. 178—18 **15 Claims**



1. A backlit digitizer tablet comprising:

(a) a housing having a base member and a top member mounted on and overlying said base member and defining therewith an intermediate space,

(b) said top member comprising:

i. an electrode array for generating electromagnetic or electrostatic fields when energized,

ii. an apertured shielding electrode extending underneath and spaced from the electrode array for directing the fields upwardly,

iii. an optically translucent member extending over the electrode array,

(c) means within the intermediate space for providing additional support for the top member, said means comprising a plurality of spaced, optically transparent posts distributed within the intermediate space and extending between and supporting the top member over the base member,

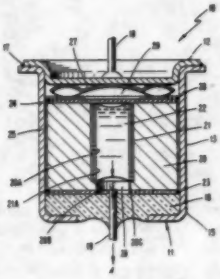
(d) means within the intermediate space for generating light that is directed upwardly through the shielding electrode and the electrode array for substantially uniformly illuminating the surface of the translucent member, said means comprising a plurality of fluorescent lamps mounted in spaced relation on the base member and on opposite sides of the posts of the additional support means.

4,943,690

POSITION INSENSITIVE SHOCK SENSOR WITH CLOSURE DELAY

Sheldon S. Bitko, E. Brunswick, N.J., assignor to Fifth Dimension, Inc., Trenton, N.J.

Filed Mar. 6, 1989, Ser. No. 319,289
Int. Cl.[5] H01H 35/14
U.S. Cl. 200—61.47 **25 Claims**



1. A shock sensor for sensing shocks, comprising:

a housing;

a container disposed in said housing and having an inner surface;

said inner surface of said container defining an axially extended chamber for containing an electrically conductive fluid;

gas passage means disposed at one end of said chamber, said gas passage means being gas permeable and conductive fluid-non-permeable;

said inner surface of said container including first and second axially adjacent zones, said second zone disposed between said first zone and said gas passage means, said first zone being conductive fluid-wettable and said second zone being conductive fluid-non-wettable, whereby said conductive fluid is normally contained in said first zone when said sensor is free of shocks;

at least one electrically conductive contact terminal disposed in said chamber and arranged to be contacted by said conductive fluid in response to said housing being acted upon by a shock at or above a threshold value, said terminal being spaced axially from said first zone whereby said second zone provides means for delaying contact closure by said conductive fluid.

4,943,691

LOW-VOLTAGE LIMITING CIRCUIT BREAKER WITH LEAKTIGHT EXTINGUISHING CHAMBER

Jean-Luc Mertz, Grenoble; Hubert Guerin, Meylan; Michel Perrot, Quaix en Chartreuse, and Patrick De Robertis, Vizille, all of France, assignors to Merlin Gerin, France

Filed Jun. 12, 1989, Ser. No. 364,102
Claims priority, application France, Jun. 10, 1988, 88 07891
Int. Cl.[5] H01H 33/06
U.S. Cl. 200—151 **10 Claims**

1. A limiting device of an electric current, comprising:

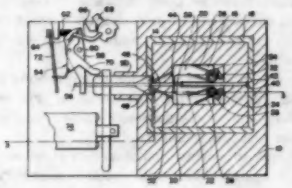
a leaktight extinguishing chamber,

a pair of separable contacts housed in said extinguishing chamber,

an insulating shield slidingly mounted in said extinguishing chamber between two end positions, one active position in which said shield is inserted between said separable contacts in open position and subdividing said extinguishing chamber into two independent parts each of which containing one of said contacts, and the other inactive end position of retreat of the shield allowing the closing of said contacts and a communication between said two parts of the extinguishing chamber,

a piston securedly united to said shield having a face subjected to the action of pressure in said extinguishing cham-

ber to move the shield to the active position when said pressure increases due to the action of an arc drawn when said contacts separate, the volume of said extinguishing chamber substantially corresponding to the dimensions of



said contacts in separated position in order to reduce to a minimum the gas volume contained in said chamber and to obtain a fast pressure increase of this gas due to the arc action.

4,943,692

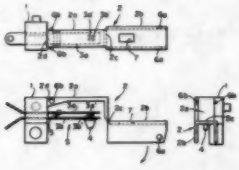
COVER INTEGRATED LEAF SWITCH

Muneyoshi Miyata, Tokyo, Japan, assignor to Mitsuku Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1989, Ser. No. 329,569

Int. Cl.[5] H01H *1/24*

U.S. Cl. 200—283 **8 Claims**



1. A leaf switch having an integral cover comprising:

an insulating base;

a plurality of leaf spring elements embedded in the base;

a cover integrally connected to said insulating base and which comprises a first and a second interengageable cover part longitudinally connected to each other through a longitudinally transversely oriented hinge portion; said first and second cover parts having a first and a second engagement member, respectively, and being pivotable about the hinge portion from an open position to a closed position for forming the cover and to envelop the leaf spring elements; the base and cover being formed from a plastic material by concurrent integral molding.

4,943,693

BARRIER DEVICE FOR AN ELECTRICAL SWITCH

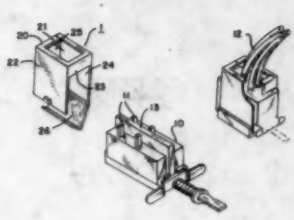
David Wang, and Chyi-Song Chen, both of Taipei, Taiwan, assignors to Acer Incorporated, China

Filed Oct. 31, 1988, Ser. No. 265,032

Int. Cl.[5] H01H *9/02*

U.S. Cl. 200—304 **6 Claims**

1. A barrier device for an electrical switch, the electrical switch having at least one connecting point, said barrier device having: a rectangular base with an opening through which access to the or each connecting point of the switch can be gained; first, second, third, and fourth side walls depending from respective sides of said base, each of said side walls having an upper edge joined to said base and a lower edge, each of said side walls lying in a single plane generally normal to said base, said first and third side walls mutually opposing each other, said second and fourth side walls mutually opposing each other, said first and third side walls being longer than said second and fourth side walls and defining a slot for receiving the switch between said first and third side walls; and a clip



member pivotally connected to the lower edge of said third side wall for movement into engagement with said first side wall so as to span the slot between said first and third side walls for preventing the removal of the switch from the slot in a direction normal to said base, said clip member having means for retaining said member in engagement with said first side wall.

4,943,694

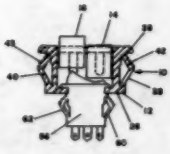
PUSH-BUTTON COVER ASSEMBLY

Neil Kroth, 4901 Kundinger Ct., Raleigh, N.C. 27606

Filed May 1, 1989, Ser. No. 345,290

Int. Cl.[5] H01H *9/02*

U.S. Cl. 200—332.1 **3 Claims**

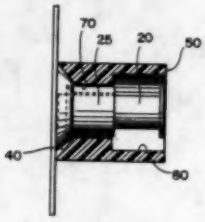


1. The combination of an electric switch cover assembly and an electric switch, the electric switch cover assembly comprising a housing, a first push-button and a second push-button; the cover assembly being positioned over the electric switch; the housing including a first side, a second side and a base portion; the first side including a first channel and a second channel; the second side including a third channel and a fourth channel; the first channel being positioned in spaced parallel relation to the third channel; the second channel being positioned in spaced parallel relation to the fourth channel; the first and second push-buttons being adapted to engage the channels; the base portion being integrally formed with the first and second side; the base portion including a central through hole and an inner lip.

4,943,695
METHOD OF AND APPARATUS FOR PROTECTING A PUSH BUTTON ON A NEWSPAPER VENDING MACHINE

Johnnie J. Valis, Shiner, Tex., assignor to Gannett Co., Inc., Arlington, Va.

Filed Jan. 5, 1988, Ser. No. 141,083
Int. Cl.[5] H01H *13/00*
U.S. Cl. 200—345 3 Claims

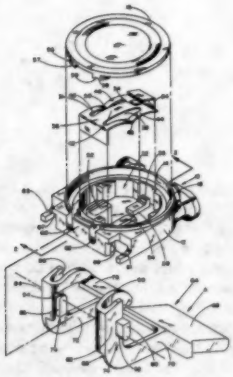


1. A vending machine comprising:
a push button protruding a first distance from an outer surface of the vending machine and adapted to actuate a mechanism such as a coin-release mechanism when depressed;
a bushing arranged around a base of the push button; and
a push button guard being defined by a body, said body including an inner face at one end of the body and an outer face at an opposite end of the body, said inner face communicating with said outer face through a stepped bore that extends through the body, said stepped bore including a narrower portion and a wider portion, said narrower portion being adapted to tightly surround the bushing and said narrower portion having a length as measured along its longitudinal axis that is less than said first distance so that when said narrower portion of said body is positioned around said bushing, the push button extends through the narrower portion of the stepped bore and into the wider portion of the stepped bore.

4,943,696
DIAPHRAGM TYPE SWITCH

Paul R. Staples, Cub Run, Ky., assignor to E. M. B. Corporation, Elizabethtown, Ky.

Filed Jan. 30, 1989, Ser. No. 302,927
Int. Cl.[5] H01H *5/20*
U.S. Cl. 200—407 6 Claims

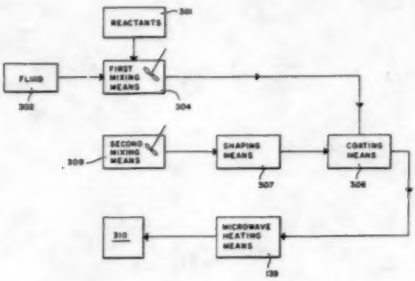


1. A switch comprising:
a cup shaped housing having an open end and a flexible diaphragm closing said open end, lugs extending from said flexible diaphragm, and slots in said cup shaped housing receiving said lugs to which together form apertures through said housing through which lead wires for said switch can be fed,
a fixed electrical terminal blade having an electrical contact and carried in said cup shaped housing,
a movable electrical contact blade having an electrical contact carried in said cup shaped housing opposite said fixed electrical terminal blade and in working relation therewith,
said movable terminal blade including a body portion, two opposed slots running lengthwise in said body portion providing a centrally disposed reactor member and a pair of outer reaction members,
a pair of oppositely disposed seats carried in said cup shaped housing against which said reaction members are biased.

4,943,697
MICROWAVE APPARATUS FOR BAKING AND BROWNING FOODSTUFF

Lawrence L. Buckholz, Jr., Middletown; Brian Byrne, East Brunswick, and Marion A. Sudol, Boonton, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 356,503, May 25, 1989, Pat. No. 4,904,490, which is a continuation-in-part of Ser. No. 295,450, Jan. 10, 1989, Pat. No. 4,882,184. This application Nov. 24, 1989, Ser. No. 440,794
Int. Cl.[5] H05B *6/68*
U.S. Cl. 219—10.55 B 1 Claim



1. Apparatus useful in enabling the making of a cooked baked goods foodstuff and in enabling a process to be carried out comprising the steps of:
(a) providing an uncooked baked goods composition having a continuous surface;
(b) providing a mixture of precursors of a Maillard or Amadori reaction product in a solvent which is capable of raising the dielectric constant of the surface of the foodstuff to be cooked whereby the foodstuff to be cooked is completely cooked in a period of time under 120 seconds;
(c) coating the mixture of (b) onto the surface of the uncooked foodstuff provided in (a); and
(d) exposing the thus coated uncooked foodstuff to microwave radiation for a period of time between 40 seconds and 120 seconds
said apparatus comprising:
(i) first mixing means for mixing a fluid carrier and Maillard or Amadori reactants;
(ii) second mixing means separate from said first mixing means for mixing dough;
(iii) shaping means downstream from said second mixing means for shaping the mixed dough;
(iv) coating means for coating the composition prepared using said first mixing means onto said shaped dough produced according to said shaping means;
(v) microwave cooking means downstream from said coat-

ing means to cook the coated shaped dough in less than 120 seconds; and

(vi) means for controlling said microwave cooking means to determine the cooking time according to the following mathematical equations and to stop the microwave cooking at the expiration of the cooking time:

$$\frac{dQ}{d\theta} = \left(\frac{R}{k} + \frac{\mu}{\lambda_1 C_p \rho^2 R^2 (T_2 - T_1)} + \frac{1}{h_A} + \lambda_3 \left[\frac{T_2 - T_1}{T_2^4 - T_1^4} \right] \right) E^2 \nu \epsilon^1$$

and

$$\Delta\theta(\text{Time}) = \frac{\text{Total Microwave Energy Input, } \Delta Q}{\left(\frac{R}{k} + \frac{\mu}{\lambda_1 C_p \rho^2 R^2 (T_2 - T_1)} + \frac{1}{h_A} + \lambda_2 \left[\frac{T_2 - T_1}{T_2^4 - T_1^4} \right] \right) E^2 \nu \epsilon^1}$$

wherein the terms:

ΔQ
is the total microwave energy input during the process;

$dQ/d\theta$
is the rate of heat input equivalent to the rate of energy use by the microwave cooking means;

R
is the effective radius of the food article being cooked;

K
is the heat transfer coefficient of the food article being cooked;

μ
is the viscosity of the coating immediately prior to cooking;

λ_1
is a proportionality constant which is a function of the coating thickness immediately prior to cooking and geometry of the article being cooked as well as the geometry of the microwave cooking means;

Cp
is the heat capacity of the coating immediately prior to cooking;

ρ
is the density of the liquid coating immediately prior to cooking;

T_1
is the temperature at the center of the food article being cooked;

T_2
is the temperature at the outer surface of the food article being cooked;

h_A
is the convection heat transfer coefficient for the air layer surrounding the food article being cooked;

λ_2
is a proportionality constant for the radiation term for concentric spheres, the coating surrounding the uncooked food;

E
is the electric field strength;

ν
is the frequency;

ϵ^1
is the relative dielectric constant of the coating material; and

$\Delta\theta$
is the time of microwave cooking.

4,943,698

HARDFACING POWDERS

Keith E. Mengel, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 31, 1985, Ser. No. 815,335
Int. Cl.[5] B23K 9/00
U.S. Cl. 219—121.47 **7 Claims**

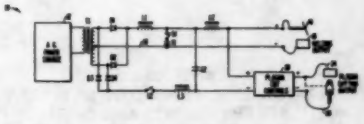
1. A plasma arc hardfacing powder consisting essentially of a hardfacing powder and a powdered, porosity reducing agent that is at least one member selected from the group consisting of aluminum, manganese, titanium, silicon, zirconium, vanadium, lithium, hafnium, yttrium, sodium, calcium, rare earths, and master alloys thereof.

4,943,699

SYSTEM FOR SUPPLYING POWER

James M. Thommes, Escondido, Calif., assignor to PowCon Inc., San Diego, Calif.

Division of Ser. No. 204,640, Jun. 9, 1988. This application Nov. 30, 1989, Ser. No. 443,888
Int. Cl.[5] B23K 9/00
U.S. Cl. 219—121.57 **4 Claims**



1. An apparatus for supplying power to a plasma cutting torch, said apparatus comprising:

a D.C. power source;

an A.C. power source for supplying a high frequency signal to the torch for initiating an arc at the torch;

inductor means for connecting the D.C. power source to the torch, wherein said D.C. power source supplies a voltage to the inductor means for passing a current through the inductor means to sustain the arc after initiation, said inductor means for stabilizing the arc; and

a circuit path connecting the D.C. power source to the torch in parallel to the inductor means for supplying current to the torch immediately after arc initiation in addition to the current supplied by the inductor means to the torch, so that the voltage applied by the D.C. power source to the inductor means required for sustaining the arc is reduced.

4,943,700

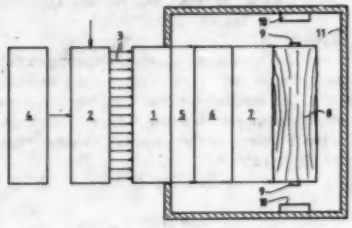
LASER SAWMILL

John L. Hughes, Melbourne, and Paul Lastavec, Narooma, both of Australia, assignors to Austral Asian Lasers Pty. Ltd., Melbourne, Australia, a part interest

Filed Oct. 31, 1988, Ser. No. 265,228
Int. Cl.[5] B23K 26/00
U.S. Cl. 219—121.67 **8 Claims**

1. A laser sawmill system for cutting and surface sealing wood, rock, plastic and ceramic objects comprising a powerful laser beam generator with a rectangularly shaped output aperture which can emit a single laser beam of rectangular cross-section or a sequence of laser beams of circular cross-section, laser beam guiding optics of rectangular cross-section, laser beam focussing optics of rectangular cross-section, said laser output aperture, beam guiding and focussing optics being enclosed within a safety enclosure which can be partially evacuated to prevent laser beam ionization of the atmosphere, the object to be cut being placed within said enclosure via an array of rollers and hydraulic arms which allow for the alignment of said object to be cut relative to the path of said fo-

cussed laser beam using an electro-optic alignment system which allows the laser beam to cut the object in a predeter-



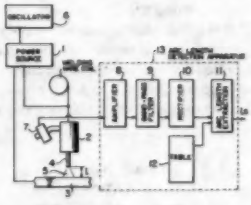
mined pattern stored in a computer which also provides the control of the said system as a whole.

4,943,701

APPARATUS FOR AND METHOD OF DETECTING ARC LENGTH, APPARATUS FOR AND METHOD OF CONTROLLING WELDING TORCH HEIGHT, AND AUTOMATIC WELDER AND AUTOMATIC WELDING METHOD

Jun Nakajima, Chiba; Takeshi Araya, Higashikurume, and Susumu Hioki, Kashiwa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 16, 1989, Ser. No. 324,555
Claims priority, application Japan, Mar. 18, 1988, 63-63378
Int. Cl.[5] B23K 9/095
U.S. Cl. 219—124.02 24 Claims



1. An apparatus comprising:

oscillation means for superposing a predetermined signal on a welding arc;

arc sound detecting means for detecting the welding arc sound generated by said arc with said predetermined signal superposed thereon;

sound pressure level extraction means for extracting and outputting, from the output of said arc sound detecting means, an arc sound pressure level signal having a frequency corresponding to the frequency of said predetermined signal; and

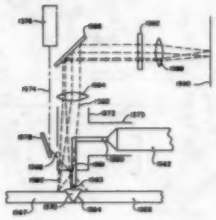
arc length determination means for determining the value of the length of said welding arc in response to the arc sound pressure level signal in accordance with a previously stored relationship between the arc length and the arc sound pressure level, and providing an output signal indicative thereof.

4,943,702

APPARATUS AND METHODS FOR CONTROLLING A WELDING PROCESS

Richard W. Richardson, Columbus, Ohio, assignor to The Ohio State University, Columbus, Ohio

Division of Ser. No. 853,233, Apr. 17, 1986, which is a division of Ser. No. 436,026, Oct. 22, 1982, Pat. No. 4,532,408, Ser. No. 456,278, Jan. 6, 1983, abandoned, and Ser. No. 603,296, Apr. 23, 1984, Pat. No. 4,595,820. This application Oct. 29, 1987, Ser. No. 114,289
Int. Cl.[5] B23K 9/12
U.S. Cl. 219—124.34 6 Claims



1. A method for illuminating a weld line to enable locating the weld line by an electronic video image detector, the method comprising:

disposing a welding electrode adjacent a weld joint preparation, said weld joint preparation comprising two metal portions disposed adjacent one another so as to define said weld line therebetween; and

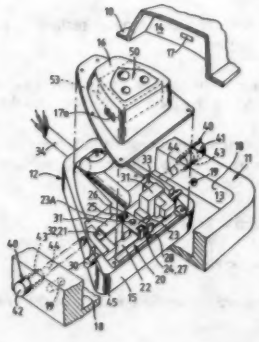
directing a beam of light onto said electrode so as to cause part of said beam to be reflected from said electrode onto said weld joint preparation, whereby an illuminated area is formed on said weld joint preparation, said illuminated area traversing said weld line and having an irregularity where said illuminated area crosses said weld line.

4,943,703

APPLIANCE STAND HAVING AN ELECTRICAL CONNECTOR

Eric Duxbury, Walsall, England, assignor to D.H. Haden Ltd., England

Filed Feb. 6, 1989, Ser. No. 307,320
Claims priority, application United Kingdom, Feb. 6, 1988, 8802739
Int. Cl.[5] H01R 13/703
U.S. Cl. 219—247 11 Claims



1. Electrical apparatus comprising:

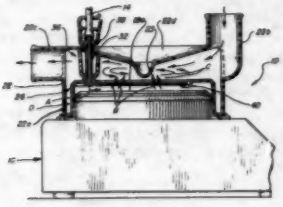
(a) a stand, an appliance supportable by the stand, and an electrical connector device located between said stand and said appliance;
(b) electrical socket means in said connector device;
(c) electrical plug means on said appliance and releasably engaged in said socket means;
(d) first detent means to mechanically couple said stand to said electrical connector device, second detent means to mechanically couple said connector device to said appliance;
(e) a bistable mechanism operative to actuate said first and second detent means; and
(f) manually actuable means at a location separate from said electrical connector device operative to switch the bistable mechanism between a first state in which the first detent means couples said stand to said device and the second detent means does no coupling, and a second state in which the second detent means couples said device to said appliance and the first detent means does no coupling.

4,943,704

HUMIDIFIER APPARATUS

Richard Rabenau, Arab; Rowland W. Kanner, and Joseph J. Cerola, both of Guntersville, all of Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Feb. 6, 1989, Ser. No. 307,261
Int. Cl.[5] F22B *1/28*
U.S. Cl. 219—275 **34 Claims**



1. A humidifier apparatus for admixture of heated water vapor into a gaseous stream, comprising:
(a) a heating structure including a heating means for generating heated vapor from water;
(b) an upper housing and chamber having a flow passageway for said gaseous stream formed in said housing secured to said heating structure and within which said heating means is exposed, including:
(1) intake and effluent conduits for flow passage of said gaseous stream through said chamber flow passageway; and
(2) a water intake conduit extending through said housing and entirely through said chamber flow passageway, and directing discharge of said water against said heating means.

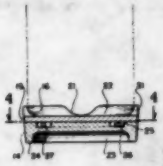
4,943,705

TISSUE WARMING APPARATUS

Michael R. Halloran, 37627 Duffle St., Palmdale, Calif. 93550

Filed May 1, 1989, Ser. No. 345,845
Int. Cl.[5] H05B *3/26*
U.S. Cl. 219—385 **2 Claims**

1. A tissue warming apparatus comprising:
a storage container for releasably holding a plurality of pre-moistened wipes;
a warmer having a peripheral upright wall defining a receptacle for insertably receiving said storage container;
resistance heater means included in said warmer having a integral thermostat for maintaining said heater means at a constant 100 degrees Fahrenheit;
said warmer being characterized as composed of water and fire-resistant composition;
said upright wall is a first circular wall extending from outside of said warmer; and



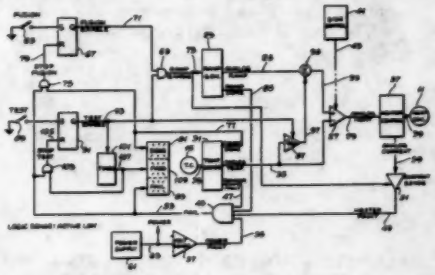
a second raised circular wall of larger diameter than said first wall carried on the opposite side of said warmer.

4,943,706

METHOD AND APPARATUS FOR FUSING THERMOPLASTIC MATERIALS

Lucian H. Lyall, Woodland Hills, and Karol Z. Rosau, Calabasas, both of Calif., assignors to R. W. Lyall & Company, Inc., Santa Fe Springs, Calif.

Filed Apr. 18, 1988, Ser. No. 182,406
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—494 **11 Claims**



1. A pipeline forming system, comprising in combination:
lengths of thermoplastic pipe having ends of uniform size;
a thermoplastic collar containing a heating element responsive to a control signal therein and sized to receive the ends of two abutting lengths of pipe;
sensor means operative to provide a sensed temperature signal corresponding to the temperature at the pipe/collar interface;
generator means operative to provide a desired temperature signal non-repetitiously increasing at a preselected rate from what corresponds to a sub-ambient temperature up to a temperature sufficient to fuse the pipe and collar together;
differential means operative to provide a control signal for said heating element corresponding to the magnitude of desired temperature signal over the magnitude of said sensed temperature signal whereby heat is gradually applied to such interface so as to raise its temperature uniformly.

4,943,707

TRANSACTION APPROVAL SYSTEM

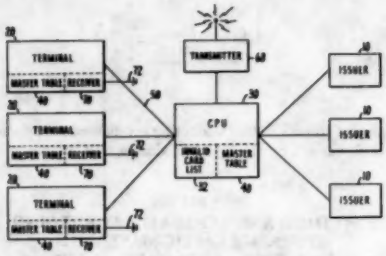
Elvis W. Boggan, Concord, Calif., assignor to Visa International Service Association, San Mateo, Calif.

Continuation-in-part of Ser. No. 596, Jan. 6, 1987, Pat. No. 4,822,985. This application Jan. 10, 1989, Ser. No. 295,548
Int. Cl.[5] G06K *5/00*
U.S. Cl. 235—380 **9 Claims**

4. A method of operating an apparatus for facilitating the off

line approval of transactions based upon the use of transaction cards each having an account number, said apparatus having a means for storing information relating to account numbers of said cards, comprising the steps of:

comparing the account number of the card presented for a transaction with the stored information about account numbers;



generating an output signal based upon the outcome of the comparison; and

storing information about the account number of the card presented for the transaction if such information had not previously existed such that a subsequent use of the card will be detected during said comparison step.

4,943,708

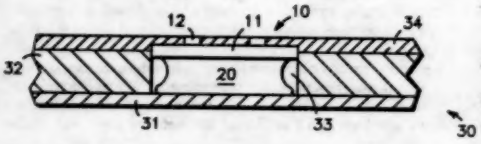
DATA DEVICE MODULE HAVING LOCKING GROOVE

Marion I. Simmons, Tempe, and Harry J. Geyer, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 1, 1988, Ser. No. 150,811

Int. Cl.[5] G06K *19/06*

U.S. Cl. 235—492 14 Claims



1. A data device module comprising:

a contact carrier having a first surface and a second surface opposite said first surface;

an integrated circuit coupled to said second surface of said contact carrier;

contact means for providing contact between said integrated circuit and a device external to said data device module, said contact means being coupled to said integrated circuit and at least partially disposed in said contact carrier;

a base having a side wall and being coupled to said second surface of said contact carrier and disposed about said integrated circuit; and

locking means for securing said data device module to a data device, said locking means being disposed about said side wall of said base, wherein said locking means comprises a groove disposed in said side wall of said base.

4,943,709

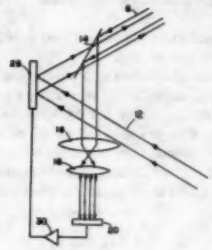
LIQUID CRYSTAL ADAPTIVE OPTICS SYSTEM

Jan Grinberg, Los Angeles; Thomas R. O'Meara, Jr., Malibu, and Murray S. Welkowsky, Chatsworth, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 11, 1989, Ser. No. 350,353

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.9 11 Claims



1. An adaptive optics system, comprising:

means for detecting the spatial phase pattern of an input beam,

means for directing an input beam which has phase distortions onto said detecting means,

a spatial phase adjustment means separate from said detecting means for adjusting the spatial phase pattern of an incident transmission beam,

means for providing said incident transmission beam to said spatial phase adjustment means, and

means responsive to said detecting means for setting said phase adjustment means to compensate for detected phase distortions in said input beam, comprising a data processor having a memory means for storing phase compensation information for a plurality of different wavelengths, said memory means providing phase adjustment information for each of said wavelengths in response to the input beam.

4,943,710

IMAGE SENSOR AND MANUFACTURING METHOD FOR THE SAME

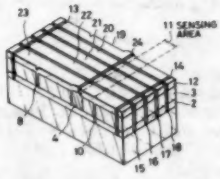
Mitsunori Sakama, Hiratsuka; Takeshi Fukada, Ebina; Naoya Sakamoto, Atsugi; Nobumitsu Amachi, Asugi; Shigenori Hayashi, Atsugi, and Takashi Inushima, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Filed Jun. 22, 1988, Ser. No. 211,225

Claims priority, application Japan, Jun. 25, 1987, 62-158334; Jun. 30, 1987, 62-162925

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 6 Claims



1. A image sensor comprising:

a plurality of photosensitive elements;

a plurality of resistance each of which is connected to corresponding one of said elements in series;

a voltage source for producing a voltage across each series connection comprising of said element and said resistance; and

a means for detecting the voltage levels at the connecting points of said element with the corresponding resistance,

wherein the value of said resistance is selected to make maximum the differential voltage at the connecting point between the voltage when this sensor is exposed to illumination and the voltage when this sensor is not exposed to illumination.

4,943,711

IMAGE INTENSIFIER TUBE WITH INPUT SCREEN HAVING A PROFILE WHICH SATISFIES A HIGHER DEGREE POLYNOMIAL

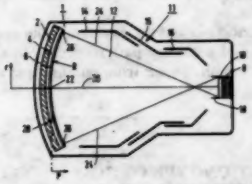
Gerardus Van Aller, and Jan Wieldraaijer, both of Heerlen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 29, 1989, Ser. No. 330,233

Claims priority, application Netherlands, Apr. 22, 1988, 8801050

Int. Cl.[5] H01J *31/50*

U.S. Cl. 250—213 VT **6 Claims**



1. An image intensifier tube having a curved input screen (1), an output screen (8) and an electron-optical system (11) for imaging photo-electrons emanating from the photocathode on the output screen, characterized in that on a side supporting the photocathode the input screen has a profile with a rise of arc (P) which expressed in a radius (r) take radially from a screen centre (22) satisfies a third or higher degree polynomial without constant and first order term.

4,943,712

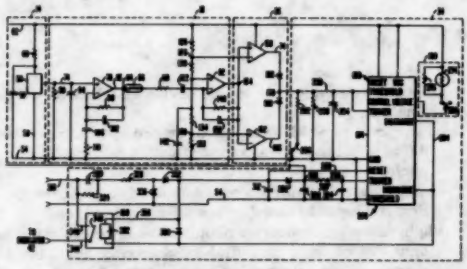
MOTION DETECTOR

Richard L. Wilder, Sparks, Nev., assignor to Tahoe Products Incorporated, Sparks, Nev.

Filed Dec. 7, 1988, Ser. No. 281,160

Int. Cl.[5] G01V *9/04*

U.S. Cl. 250—221 **19 Claims**



1. A motion detecting circuit comprising:

motion detecting means for detecting a moving infrared energy source and for generating a motion detected signal in response thereto;

first current flowing means, coupled to the motion detecting means, for flowing a first current in response to the motion detected signal;

a first capacitance, coupled to the current flowing means, for providing a voltage in response to the current flowing from the current flowing means;

first voltage detecting means, coupled to the first capacitance, for detecting a first voltage value;

second voltage detecting means, coupled to the first capacitance, for detecting a second voltage value that is higher than the first voltage value;

second current flowing means, coupled to the first voltage detecting means and to the second voltage detecting means, for flowing a second current when the voltage provided by the first capacitance is above the second voltage value and for inhibiting the second current flow when the voltage provided by the first capacitance is below the first voltage value: and

motion indicating means, coupled to the second current flowing means, for providing a sensory stimulus in response to the second current.

4,943,713

BOTTLE BOTTOM INSPECTION APPARATUS

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Filed Nov. 22, 1988, Ser. No. 274,929

Claims priority, application Japan, Nov. 27, 1987, 62-299417; Nov. 27, 1987, 62-299418

Int. Cl.[5] G01N *21/90*

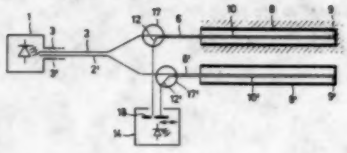
U.S. Cl. 250—223 B **15 Claims**

1. A bottle bottom inspection apparatus in which an image sensor is located above a mouth of a bottle made of a transparent material and whose bottom is to be inspected and said bottle bottom is irradiated upwardly by a light source exterior of said bottle and said bottle is picked up by said image sensor via said bottle mouth thereby to inspect said bottle bottom, comprising: optical means disposed between said light source and said bottle bottom, wherein said optical prevents light from said light source from being perpendicularly introduced onto said bottle bottom and causes said light to be projected upwardly onto said bottle bottom at a predetermined incident angle from a position outside the perimeter of said bottle bottom to said bottle bottom.

4,943,714
METHOD OF CONTINUOUS MEASUREMENT OF DAMPING IN AN ELONGATED LIGHT WAVE CONDUCTOR-SENSOR HAVING ONLY ONE ACCESSIBLE END

Friedrich K. Levacher, Brauweiler; Helmut Federmann; Georg Noack, both of Bergisch Gladbach, and Anton Kraus, Overath-Steinenbrück, all of Fed. Rep. of Germany, assignors to Felten & Guilleaume Energietechnik AG, Cologne, Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 309,802
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1988, 3804135
Int. Cl.[5] H01J 5/16
U.S. Cl. 250—227.16 1 Claim



1. A method of continuous measurement of damping of a light beam in a light wave conductor (LWC)-sensor, comprising the steps of continuously emitting from a light transmitter a measuring light beam and guiding the same in a first direction through a beam divider in which it is split into two partial light beams; guiding a first partial light beam in the first direction through an elongated LWC-sensor whose damping properties is to be measured; reflecting at the free end of said LWC-sensor said first partial light beam by 180° to propagate in a reverse second direction against said beam divider; deflecting said first partial light beam at said beam divider by 90° and guiding the same in the deflected third direction into a light receiving and evaluating unit; emitting from said light transmitter a reference light beam which is equal to said measuring light beam; guiding said measuring light beam via a light wave conductor through a first Y-beam divider; guiding said first partial light beam via a light wave conductor from said first Y-beam divider into said LWC-sensor which is fixed to a structural part to be monitored; guiding via a light wave conductor said deflected portion of said first partial light beam into an input opening of said light receiving and evaluating unit; and, in the same manner, guiding said reference light beam through a light wave conductor which corresponds in thermal properties to the first mentioned light wave conductor, into a second Y-beam divider, guiding a reference partial light beam from said second Y-beam divider into a reference LWC-sensor which is equal to said fixed LWC-sensor and being arranged in close proximity thereto; and guiding deflected portions of said reference partial light beam against a shiftable diaphragm arranged in said input opening of the light receiving and evaluating unit; and operating said shiftable diaphragm to pass said reference partial light beam into said unit before the passage of said measuring partial light beam into said measuring unit to act as a measuring standard.

4,943,715
LIMIT SWITCH HAVING MEANS TO EVALUATE ITS ACTUATING STROKE

Keisuke Konishi, Takatsuki, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 20, 1989, Ser. No. 326,008
Claims priority, application Japan, Mar. 18, 1988, 63-66822
Int. Cl.[5] G01D 5/34
U.S. Cl. 250—229 7 Claims

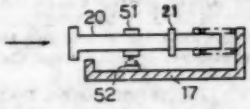
1. A limit switch for detecting presence of an article as it passes by said limit switch, comprising:

a fixed casing;

an actuating part supported by said casing so as to be moveable over a certain maximum operation range and is adapted to be actuated by said passing article;

a first contact set which is adapted to produce a first switch output when displacement of said actuating part is smaller than a certain minimum operation stroke and a second switch output when displacement of said actuating part is larger than said minimum operation stroke;

a second contact set which is adapted to produce a first stroke indicating output when displacement of said actuating part is smaller than a certain minimum acceptable stroke which is larger than said minimum operation value and a second stroke indicating output when displacement of said actuating part is larger than said minimum acceptable stroke;

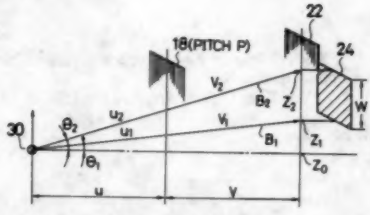


stroke evaluation means for evaluating the magnitude of the stroke of said actuation part according to a result of logical operation on outputs from said first and second contact sets.

4,943,716
DIFFRACTION-TYPE OPTICAL ENCODER WITH IMPROVED DETECTION SIGNAL INSENSITIVITY TO OPTICAL GRATING GAP VARIATIONS

Souji Ichikawa, Sagamihara; Hideki Oka, Kawasaki; Naoyoshi Terao, Urawa, and Seiji Sakagami, Kawasaki, all of Japan, assignors to Mitutoyo Corporation, Minato, Japan

Filed Jan. 18, 1989, Ser. No. 298,430
Claims priority, application Japan, Jan. 22, 1988, 63-12143; Feb. 25, 1988, 63-42626
Int. Cl.[5] G01D 5/34
U.S. Cl. 250—231.16 2 Claims



1. An optical encoder comprising:

a coherent diffusive light source having an effective wave length λ;

a main scale provided at a position spaced apart u from the diffusive light source and formed with a first grating of a pitch P;

an index scale provided at a position spaced apart v from the first grating and formed with a second grating; and

a light-receiving element for photoelectrically transducing a light emitted from the diffusive light source and filtered through the first and second gratings: wherein a detection signal periodically variable in accordance with a relative displacement between the main scale and the index scale is produced,

characterized in that the light-receiving element is adopted to receive two rays satisfying the relationship between the following equations in order to remove a component of fluctuations due to the grating gap v of a geometric image of the first grating in the detection signal,

$$(u_2 v_2/(u_2 + v_2)) - (u_1 v_1/(u_1 + v_1)) \simeq m\lambda^2/\lambda$$

$$W \simeq n((u_2 + v_2)\sin\theta_2 - (u_1 + v_1)\sin\theta_1)$$

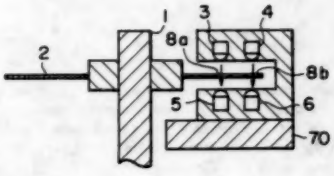
where m and n are integers, u1 and u2 are lengths of light paths of the rays between the diffusive light source and the first grating, v1 and v2 are lengths of light paths of the rays between the first and second gratings, W is a center interval between the rays on the second grating, $\theta 1$ and $\theta 2$ are angles made by a perpendicular line drawn from the diffusive light source to the gratings with the rays.

4,943,717

ANGLE MEASURING DEVICE HAVING SPECIFIC SIGNAL PROCESSING ARRANGEMENT

Masayuki Ikeuchi, and Kouichi Okamura, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1989, Ser. No. 413,644
Int. Cl.[5] G01D *5/34*
U.S. Cl. 250—231.17 **4 Claims**



1. A angle measuring device comprising:
a rotating disc which is adapted to rotate in synchronization with a crankshaft and which has a plurality of slits formed along the circumference thereof;
a light-emitting means arranged in the vicinity of said rotating disc;
a light-receiving means adapted to receive light emitted from said light-emitting means through the slits of said rotating disc; and
a signal processing circuit adapted to process signals output from said light-receiving means and including: a semiconductor substrate, a plurality of islands formed on the surface of said semiconductor substrate from diffusion layers, a protective-resistor element formed in one of said islands and connected to said light-emitting means, and separation layers separating the island on which said protective-resistor element is formed from the other islands, no other elements being formed on the island on which said protective-resistor element is formed.

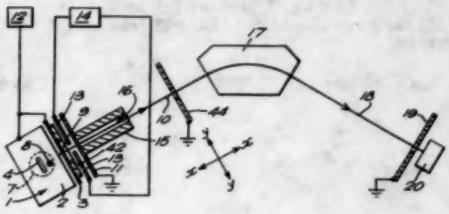
4,943,718

MASS SPECTROMETER

Raymond C. Haines, Kelsall, and Patrick J. Turner, Wilmslow, both of United Kingdom, assignors to VG Instruments Group Limited, Crawley, England

Filed Feb. 17, 1989, Ser. No. 312,632
Claims priority, application United Kingdom, Feb. 18, 1988, 8803837
Int. Cl.[5] H01J *49/14*
U.S. Cl. 250—288 **20 Claims**

1. A mass spectrometer comprising:
(a) an ion source for producing a beam of ions, the ion beam having an ion-optical axis, said ion source being provided with an electron emission source and magnet means which are cooperable to produce an electron beam within said ion source, the electron beam having an axis;
(b) a mass analyzer;
(c) first and second electrode means disposed about the ion-optical axis between said electron beam axis and said mass analyzer and cooperable to limit the angular divergence of the ion beam produced by said ion source; and



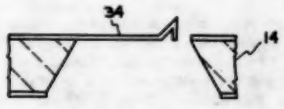
(d) magnetic field screening means disposed to reduce substantially the magnetic field due to said magnet means along at least a part of the ion-optical axis between said first and said second electrode means.

4,943,719

MICROMINIATURE CANTILEVER STYLUS

Shinya Akamine; Thomas R. Albrecht, both of Stanford, and Thomas E. Carver, Mountain View, all of Calif., assignors to The Board of Trustees of the Leland Stanford University, Stanford, Calif.

Filed Jan. 17, 1989, Ser. No. 297,770
Int. Cl.[5] G01B *5/28*; G01C *7/00*; H01J *37/26*; H01L *21/306*
U.S. Cl. 250—306 **19 Claims**



13. A microminiature cantilever stylus, comprising:
a thin-film cantilever arm member; and
a projecting tip fixed to said cantilever arm member, said tip formed from a (100) silicon wafer and having a base formed in the (100) plane and fixed to said cantilever arm, said tip having three side surfaces which meet at a point, wherein first and second perpendicular side surfaces extend perpendicularly from the (100) plane of said base, said tip having a third oblique side formed in the (111) plane and extending from said base.

4,943,720

ELECTRONIC PROBE

Barbara L. Jones, 80 Chisbury Place, Forest Park, Bracknell RG 123 TX, England

Filed Aug. 2, 1989, Ser. No. 389,056

Claims priority, application United Kingdom, Aug. 3, 1988, 8818445

Int. Cl.[5] H02J 37/26

U.S. Cl. 250—306 8 Claims

1. An electronic probe comprising an electrically conductive base and a fine pointed tip, made of a semi-conducting diamond material, in electrical contact with the base.

4,943,721

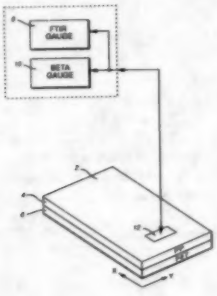
METHOD OF OBTAINING ACCURATE COMPOSITIONAL INFORMATION OF MULTI-LAYER COMPOSITIONS

Warren D. Vidrine, Jr., San Jose, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Jun. 22, 1989, Ser. No. 370,420

Int. Cl.[5] G01N 23/02, 21/35

U.S. Cl. 250—308 22 Claims



1. Process for measuring the composite thickness of a multi-layer composition which comprises the steps of:

obtaining a known absorption coefficient and a known density for each material forming a layer of the composition;

measuring the fractional composition of each layer forming the multi-layer composition with a first non-contact gauge;

determining a nominal composite absorption coefficient for the multi-layer composition using the absorption coefficient of each layer and the fractional composition of each layer;

measuring the multi-layer composition with a beta gauge to produce an output;

determining a composite mass of the multi-layer composition using the nominal composite absorption coefficient and the beta gauge output;

determining a composite density of the multi-layer composition using the fractional composition of each layer and the known density of each layer; and,

determining the composite thickness of the multi-layer composition using the composite mass and the composite density.

4,943,722

CHARGED PARTICLE BEAM SCANNING APPARATUS

Bernard C. Breton, Great Shelford; John T. L. Thong, Leckampton, and William C. Nixon, Cambridge, all of United Kingdom, assignors to Trialsite Limited, United Kingdom

Filed Sep. 24, 1987, Ser. No. 100,751

Claims priority, application United Kingdom, Sep. 24, 1986, 8622976

Int. Cl.[5] H01J 37/28

U.S. Cl. 250—310 21 Claims

1. Scanning beam apparatus adapted to display two views of a surface for stereoscopic viewing, wherein two series of electrical signals are obtained by scanning the surface with a beam first with the beam axis at one angle to the surface and then with the beam axis at a different angle or direction from the first, characterized by a frame store to which the two series of electrical signals are supplied, the frame store including a feedback loop and input and feedback multiplying means and forming a recursive filter, and signal converter means including an red/green/blue look-up table memory means for generating red, green and blue signals for display by a color monitor.

4,943,723

RADIATION IMAGE READ-OUT METHOD

Yuuma Adachi, and Nobuyoshi Nakajima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

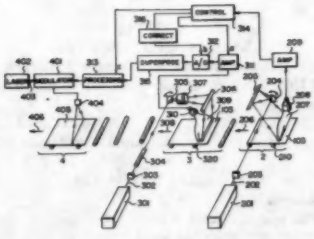
Continuation of Ser. No. 776,185, Sep. 13, 1985. This application Jul. 11, 1988, Ser. No. 217,022

Claims priority, application Japan, Sep. 13, 1984, 59-192097

The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.

Int. Cl.[5] G03C 5/16

U.S. Cl. 250—327.2 3 Claims



1. A radiation image read-out method in which, prior to final read-out for exposing a stimulable phosphor sheet carrying a radiation image of an object stored therein to stimulating rays which cause the stimulable phosphor sheet to emit light in proportion to the stored radiation energy, detecting the emit-

ted light by use of a photoelectric read-out means to obtain an electric image signal for reproducing a visible image, preliminary read-out is conducted by use of stimulating rays of a level lower than the level of stimulating rays used in the final read-out, read-out conditions in the final read-out and/or image processing conditions are adjusted on the basis of image input information on the stimulable phosphor sheet obtained by the preliminary read-out, and the final read-out is conducted by use of the adjusted conditions,

wherein the improvement comprises the steps of:

(i) when the image read-out is conducted for a plurality of the stimulable phosphor sheets carrying a radiation image of the same object recorded thereon by combination image recording, conducting said preliminary read-out and said final read-out only for the first stimulable phosphor sheet which is first subjected to the image read-out, and

(ii) conducting only said final read-out for the other stimulable phosphor sheets by use of the read-out conditions and/or image processing conditions adjusted on the basis of the image input information obtained by said preliminary read-out of said first stimulable phosphor sheet.

4,943,724

RADIATION IMAGE RECORDING AND READ-OUT APPARATUS

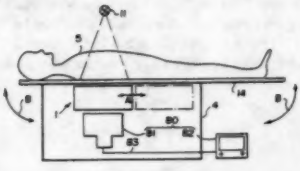
Shigeru Saotome, and Masamitsu Ishida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 18, 1988, Ser. No. 182,678

Claims priority, application Japan, Apr. 17, 1987, 62-94546; Apr. 17, 1987, 62-94549

Int. Cl.[5] G01N *23/04*

U.S. Cl. 250—327.2 **5 Claims**



1. A radiation image recording and read-out apparatus which comprises:

(i) a recording and read-out unit provided with:

(a) a case for housing therein a stimulable phosphor sheet and having longitudinal and transverse dimensions approximately equal to the longitudinal and transverse dimensions of a single image recording area on said stimulable phosphor sheet,

(b) an image recording section for holding said stimulable phosphor sheet in said case, and having a radiation image of an object stored on said stimulable phosphor sheet,

(c) an image read-out section provided in said case for exposing said stimulable phosphor sheet carrying said radiation image stored thereon to stimulating rays which cause said stimulable phosphor sheet to emit light in proportion to the stored radiation energy, and photoelectrically detecting the emitted light to obtain image signals, and

(d) an erasing section provided in said case for releasing the radiation energy remaining on said stimulable phosphor sheet, for which the detection of said emitted light has been carried out, before the image recording is carried out on said stimulable phosphor sheet,

(ii) a unit movement means for moving said recording and read-out unit so that said recording and read-out unit takes a first position at which said stimulable phosphor sheet held at said image recording section is disposed at an image recording position exposed to radiation passing through said object, and a second position retracted from said first position, and

(iii) a fluoroscopic means for receiving the radiation passing through said object at the time said recording and read-out unit is present at said second position, and converting the radiation into signals for a visible image.

4,943,725

RADIATION IMAGE READ-OUT APPARATUS

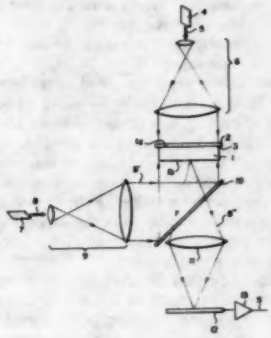
Shuji Ono, and Tsutomu Kimura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 17, 1988, Ser. No. 259,084

Claims priority, application Japan, Oct. 16, 1987, 62-261040

Int. Cl.[5] G03G *5/16*

U.S. Cl. 250—327.2 **5 Claims**



1. A radiation image read-out apparatus, comprising:

(i) a microchannel spacial light modulator positioned such that a stimulable phosphor sheet carrying a radiation image stored thereon is less than a predetermined distance from a front surface of said microchannel spacial light modulator,

(ii) a stimulating ray source comprising means for irradiating approximately uniform stimulating rays simultaneously to the overall surface of said stimulable phosphor sheet from the side opposite to said microchannel spacial light modulator with said stimulable phosphor sheet intervening between said stimulating ray source and said microchannel spacial light modulator,

(iii) a reading light source comprising means for irradiating approximately uniform reading light simultaneously to the overall area of a rear surface of said microchannel spacial light modulator after said stimulating rays produced by said stimulating ray source have been irradiated to said stimulable phosphor sheet to cause said stimulable phosphor sheet to emit light in proportion to the stored radiation energy and the light emitted by said stimulable phosphor sheet has been detected by said microchannel spacial light modulator, and

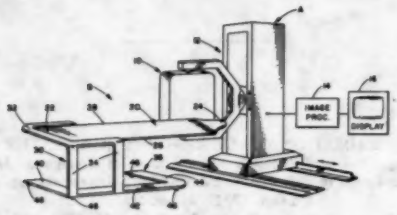
(iv) a two-dimensional photodetector comprising means for detecting said reading light produced by said reading light source, irradiated to the rear surface of said microchannel spacial light modulator, and reflected and subjected to spacial modulation in accordance with said radiation image by said microchannel spacial light modulator.

4,943,726

TOMOGRAPHIC AND WHOLE BODY IMAGING TABLE

Steven J. Plummer, Hudson, Ohio, assignor to Picker International, Inc., Highland Heights, Ohio

Filed Sep. 20, 1988, Ser. No. 246,774
Int. Cl.[5] G01T *1/166*
U.S. Cl. 250—363.02 11 Claims



1. A scanning nuclear camera apparatus comprising:

a camera head for converting radiation from a subject into output signals indicative thereof;

a subject supporting top having a head end, a foot end, and first and second sides;

a gantry means for supporting and selectively moving the camera head (1) longitudinally along upper and lower surfaces of the top, and (2) peripherally around a central portion and the head end of the top; and,

an undercarriage for supporting the top without interfering with the movement of the camera head and without interfering with reception by the camera head of radiation events emanating from the supported subject during the peripheral movement of the camera head, the undercarriage including:

a top retaining portion disposed only adjacent the foot end of the top such that the head end and the central portion are free of the top retaining portion such that the top retaining portion is not juxtaposed between the support subject and the camera head as the camera head moves peripherally around the central portion and the head end of the top,

a support portion extending from the top retaining portion adjacent an intersection of the first side and the foot end of the top to a floor engaging portion such that the head end and the second side are cantilevered from the support portion to provide free access for the camera head to move without interference from the support portion during both the longitudinal movement along the top lower surface and the peripheral movement around the central portion; and,

an image means for constructing an image representation from the output signals.

4,943,727

RADIOGRAPHIC INTENSIFYING SCREEN

Akira Kitada, Odawara; Kikuo Yamazaki; Terumi Matsuda, both of Minami-ashigara, and Jun Kawagoe, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 21, 1988, Ser. No. 146,694
Claims priority, application Japan, Jan. 21, 1987, 62-11902
Int. Cl.[5] G21K *4/00*
U.S. Cl. 250—483.1 7 Claims

1. A radiographic intensifying screen comprising a support, a phosphor layer which comprises a binder and a phosphor dispersed therein and a protective film, superposed in order, wherein a deposited metal film is provided on one or both surfaces of said protective film, said deposited metal film having a light transmittance ranging from 10% to 90% at the peak wavelength of the emission of the phosphor and a thickness ranging from 10 to 1000 angstroms whereby the surface of the

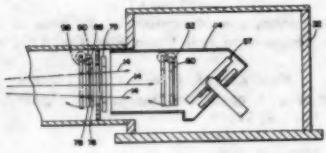
screen is essentially prevented from being electrostatically charged.

4,943,728

BEAM PATTERN CONTROL SYSTEM FOR AN ION IMPLANTER

Jerald P. Dykstra, and Andrew M. Ray, both of Austin, Tex., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 28, 1989, Ser. No. 317,225
Int. Cl.[5] H01J *37/317*
U.S. Cl. 250—492.3 12 Claims



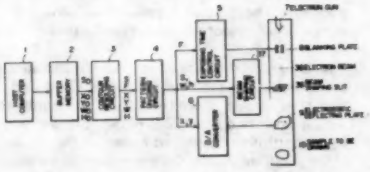
1. In an ion implanter comprising a vacuum chamber, wafer-receiving support means within said vacuum chamber, means for directing an ion beam onto a wafer received on said support means, and a first aperture plate having a beam defining aperture formed therein positioned to intercept the beam upstream of said support means, the improvement wherein the aperture formed in said aperture plate is elliptical.

4,943,729

ELECTRON BEAM LITHOGRAPHY SYSTEM

Kimiaki Ando, Nishitama; Mitsuo Ooyama, Hachioji, and Norio Saitou, Iruma, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 15, 1988, Ser. No. 284,733
Claims priority, application Japan, Dec. 18, 1987, 62-318808
Int. Cl.[5] H01J *37/30*
U.S. Cl. 250—492.3 5 Claims



1. An electron beam lithography system comprising contour resolving circuit means for resolving an input original pattern data into contour portion pattern data and inner portion pattern data in accordance with a designated dimension, flag means for adding flag data to the resolved pattern data to distinguish the contour portion pattern data from the inner portion pattern data, and means for outputting the resolved pattern data with the flag data.

4,943,730

CHARGED PARTICLE BEAM LITHOGRAPHY METHOD

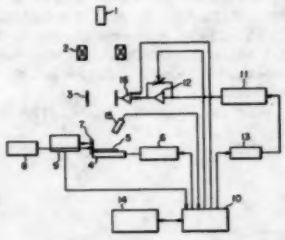
Hitoshi Takemura; Nobuo Gotoh, and Moriyuki Isobe, all of Tokyo, Japan, assignors to JEOL Ltd., Tokyo, Japan

Filed Sep. 15, 1989, Ser. No. 407,576

Claims priority, application Japan, Sep. 19, 1988, 63-234254; Sep. 19, 1988, 63-234255

Int. Cl.[5] H01J 37/302

U.S. Cl. 250—492.3 7 Claims



1. In a charged particle beam lithography method wherein the workpiece material is mounted upon a stage the position of which is detected by a laser interferometer for positioning a writing field of the workpiece under the particle beam and wherein a particle beam deflection system directs the beam over the frame to write patterns upon each writing field of the workpiece, said deflection system comprising an amplifier for amplifying a deflection signal applied to deflector means, the movement of the stage to present new writing fields to the particle beam being controlled by digital writing field data stored in the memory of a controller and the patterns to be written to each writing field by deflection of the charged particle beam being controlled by pattern data stored in the memory of a controller, the improvement for permitting expanding or reducing the size of patterns according to a scaling factor comprising the steps for:

(a) changing the gain of the deflection system amplifier for sending the deflection signal to the charged beam deflector according to the scaling factor,

(b) converting the writing field data that represents the intended movement amount of the stage required for the shift of the writing field into a signal according to the scaling factor,

(c) moving the stage by one writing field on the converted data signal,

(d) comparing a count signal from the laser interferometer representing the position of the stage with said converted data signal to obtain a position error signal,

(e) writing patterns in the field by deflecting the charged particle beam in accordance with digital pattern data signals converted into analog signals applied to the deflection system amplifier and correcting said deflection of the charged particle beam in accordance with the error signal, and

(f) repeating the steps (c), (d) and (e).

4,943,731

APPARATUS FOR HANDLING SOURCE CAPSULE ASSEMBLIES

Glen A. Brown, 36 Hester Street, Dartmouth, Nova Scotia, Canada (B3A 1K2)

Filed Oct. 18, 1989, Ser. No. 423,231

Claims priority, application United Kingdom, Oct. 19, 1988, 8824452

Int. Cl.[5] G21F 5/02

U.S. Cl. 250—497.1 21 Claims

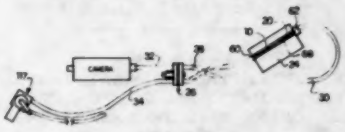
1. An apparatus for inserting a radioactive source assembly into a container comprising:

an insertion tube having an inlet end and an outlet end;

first coupling means for coupling the outlet end of the insertion tube to the container for transferring the source assembly from the tube to the container;

source inserter means including first and second ports, means for receiving the source assembly and means for aligning the source assembly with the first and second ports;

cable means including a flexible drive cable and means for advancing and retracting the cable;



second coupling means connecting one of the ports of the inserter means to the inlet end of the insertion tube and connecting the other of the ports of the insertion means to the cable means for receiving the flexible drive cable therefrom whereby the source assembly may be placed in the inserter means, aligned with the first and second ports and driven from the inserter means through the insertion tube into the container by the flexible drive cable of the cable means.

4,943,732

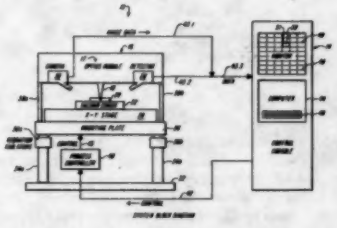
METHOD AND APPARATUS FOR DEFECT DETECTION AND LOCATION

Nicholas P. Economou, Lexington, Mass., assignor to Micrion Corporation, Peabody, Mass.

Filed Aug. 16, 1989, Ser. No. 394,674

Int. Cl.[5] G01N 21/88

U.S. Cl. 250—572 22 Claims



1. Apparatus for locating defects in a substantially planar liquid crystal display (LCD) panel, the apparatus comprising

light source means for generating an interrogating light beam to impinge upon the LCD panel,

scanning means for introducing relative motion between said interrogating light beam and the LCD panel to scan said interrogating light beam in a predetermined pattern about the LCD panel,

position signalling means for generating a position signal having an instantaneous value representative of an instantaneous position of said interrogating light beam with respect to the LCD panel,

photodetector means for

detecting any of reflected, refracted, scattered or transmitted light resulting from impingement of said interrogating light beam upon the LCD panel, and

generating in response thereto a detector signal having an instantaneous value representative of detected magnitude of said reflected, refracted, scattered or transmitted light,

each said instantaneous detector signal value corresponding with the instantaneous position of said interrogating light beam with respect to the LCD panel, and

discontinuity detection means, responsive to said detector signal, for detecting discontinuities in the value of said detector signal, said discontinuities being representative of defects in the LCD panel, said discontinuity detection means including

location means, responsive to said detector signal and said position signal, for correlating each said discontinuity in the value of said detector signal with a corresponding location on the LCD panel to assign a location to each detected defect on the LCD panel.

4,943,733

PROJECTION OPTICAL APPARATUS CAPABLE OF MEASUREMENT AND COMPENSATION OF DISTORTION AFFECTING RETICLE/WAFER ALIGNMENT

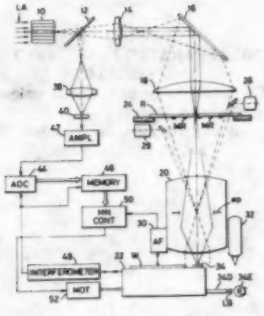
Susumu Mori, Tama, and Masato Shibuya, Kawasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 192,766, May 10, 1988, abandoned. This application Nov. 15, 1989, Ser. No. 436,745

Claims priority, application Japan, May 15, 1987, 62-117167; May 18, 1987, 62-119081; May 18, 1987, 62-119082

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—548 **21 Claims**



1. A projection optical apparatus for illuminating a reticle, on which a desired pattern is formed by a light-transmitting member and a light-intercepting member, by illuminating light from an illuminating optical system, and forming the image of said pattern on a predetermined imaging plane through a projection optical system, including:

stage means movable along the imaging plane of said projection optical system;

first position detecting means for outputting a position signal corresponding to the position of said stage means;

light-emitting means provided on said stage means and having a light-emitting surface of predetermined shape for emitting light to said projecting optical system;

photoelectric detector means for receiving light from the light-emitting surface of said light-emitting means through said projection optical system and said reticle, respectively; and

second position detecting means for controlling said stage means so that a projected image of said light-emitting surface moves relative to said reticle, and detecting the positional relation between the projected image of said light-emitting surface and said reticle on the basis of the output from said photoelectric detector means and the output from said first position detecting means during said movement;

the numerical aperture of the light-receiving surface of said photoelectric detector means relative to said reticle being set substantially equal to the numerical aperture of said illuminating light relative to said reticle, and the numerical aperture of said light-emitting means relative to said imaging plane being set greater than the numerical aperture of said projection optical system relative to said imaging plane.

4,943,734

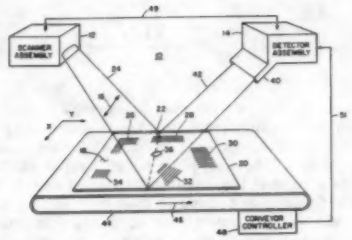
INSPECTION APPARATUS AND METHOD FOR DETECTING FLAWS ON A DIFFRACTIVE SURFACE

Carl E. A. Johnson, Merrimack; Jay L. Ormsby, Salem, both of N.H.; Eric T. Chase, Andover; George S. Quackenbos, Newburyport; Sergey V. Broude, Acton, and Abdu Bou dour, West Newton, all of Mass., assignors to QC Optics, Inc., Burlington, Mass.

Filed Jun. 30, 1989, Ser. No. 373,914

Int. Cl.[5] G01N *21/88*

U.S. Cl. 250—572 **16 Claims**



1. An optical inspection system for detecting flaws on a diffractive surface, comprising:

means for illuminating a surface to be inspected to generate a first scattered energy angular distribution in response to a flaw on the surface, or a second scattered energy angular distribution in response to an unflawed surface;

means for sensing said first and second energy distributions;

means, responsive to the means for sensing, for establishing the minimum detected energy level within said angular distribution;

means, for detecting whether said minimum detected energy level is in a first predetermined energy range or a second predetermined energy range; and

means, responsive to said means for determining, for indicating that no flaw is present when said minimum energy detection level is in said first range and a flaw is present when said minimum detected energy level is in said second range.

4,943,735

APPARATUS FOR MEASURING CONCENTRATION OF LIQUID DEVELOPER

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Continuation-in-part of Ser. No. 828,234, Feb. 11, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 204,494

Claims priority, application Japan, Feb. 18, 1985, 60-031201

Int. Cl.[5] G01N *21/01*

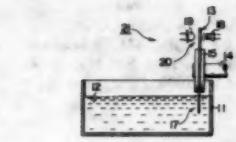
U.S. Cl. 250—573 **5 Claims**

1. An apparatus for measuring the concentration of a colored component dispersed in a liquid, said apparatus comprising:

a vessel for containing a liquid having a colored component dispersed therein;

a holding member having a thickness T and a substantially circular opening formed therein, said opening being adapted to retain a sample of said liquid, said opening having a diameter D, wherein $D \leqq T+1/T$;

means for moving said holding member in such a manner that said opening moves between a supply station where it is immersed into said vessel to receive and retain said liquid sample and a measuring station where a measurement of said liquid sample in said opening takes place; and



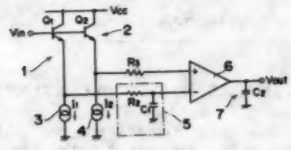
photoelectric detector means for measuring the light transmitted through said liquid sample at said measuring station.

4,943,736

WAVEFORM CONVERTING APPARATUS

Seiichiro Kihara, Nara, and Naonori Okabayashi, Sakurai, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 26, 1989, Ser. No. 301,581
Claims priority, application Japan, Jan. 26, 1988, 63-15450
Int. Cl.[5] H03K *5/00*; G06G *7/10*; G05F *3/16*
U.S. Cl. 307—261 **8 Claims**



1. A waveform converting device comprising:

first and second emitter follower circuits for independently converting the impedance of an input signal;

said first emitter follower circuit including a first transistor;

said second emitter follower circuit including a second transistor;

first constant current supply means operatively connected to an emitter of said first transistor provided in said first emitter follower circuit, for supplying a first constant current means of a first value,

second constant current supply means operatively connected to an emitter of said second transistor provided in said second emitter follower circuit, for supplying a second constant current which is greater than said first value, the ratio between said first and second constant currents being a set constant,

a first integrating circuit for integrating an output voltage of said first emitter follower circuit,

a comparator for comparing the output voltage of said first integrating circuit with an output voltage of said second emitter follower circuit, and

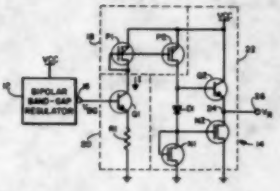
a second integrating circuit for integrating an output voltage of said comparator.

4,943,737

BICMOS REGULATOR WHICH CONTROLS MOS TRANSISTOR CURRENT

Tzen-Wen Guo, Milpitas, and Jonathan J. Stinehelfiner, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 12, 1989, Ser. No. 421,230
Int. Cl.[5] G05F *3/16*
U.S. Cl. 307—296.7 **11 Claims**



1. A bipolar/CMOS regulator circuit for generating a CMOS gate-controlling voltage, which varies favorably with temperature, power supply voltage and process corners so as to yield a well-controlled CMOS current, said regulator circuit comprising:

a current mirror section (18) including a first P-channel MOS transistor (P1) and a second P-channel MOS transistor (P2), said first P-channel transistor (P1) having its source connected to a supply potential (VCC) and its gate and drain connected together, said second P-channel transistor (P2) having its source also connected to the supply potential (VCC) and its gate connected to the gate of said first P15 channel transistor (P1);

a current source section (20) formed of a first bipolar transistor (Q1) and an emitter resistor (R1), said first bipolar transistor (Q1) having its collector connected to the drain of said first P-channel transistor (P1), its base connected to receive a regulated reference voltage, and its emitter connected to one end of the emitter resistor (R1), the other end of the emitter resistor (R1) being connected to a ground potential;

an output section (22) formed of a diode (D1), a first N-channel MOS transistor (N1), a second bipolar transistor (Q2), and a second N-channel MOS transistor (N2), said diode (D1) having its anode connected to the drain of said second P-channel transistor (P2) and its cathode connected to the gate and drain of said first N-channel transistor (N1), said first N-channel transistor (N1) having its source connected to the ground potential; and

said second bipolar transistor (Q2) having its collector connected to the supply potential (VCC), its base connected to the anode of the diode (D1), and its emitter connected to the drain of said second N-channel transistor (N2) and to an output node for generating a CMOS gate-controlling voltage (V_R), said second N-channel transistor (N2) having its gate connected to the cathode of said diode (D1) and its source connected also to the ground potential.

4,943,738

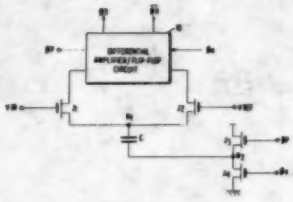
DIGITAL SIGNAL INPUT BUFFER CIRCUIT HAVING A SIMPLE CONSTRUCTION AND CAPABLE OF RETAINING DATA

Katsuji Hoshi, Tokyo, Japan, assigner to NEC Corporation, Tokyo, Japan

Filed Dec. 29, 1988, Ser. No. 291,886
Claims priority, application Japan, Dec. 29, 1987, 62-332299
Int. Cl.[5] H03K *03/356, 5/24*
U.S. Cl. 307—362 **5 Claims**

1. An input buffer circuit which includes a flipflop circuit and which receives an input voltage signal and a reference

voltage to amplify a difference between the input voltage signal and the reference voltage in response to an activation signal, comprising first and second transistors having their sources commonly connected to a first node and their drains coupled to a pair of inputs of the flipflop circuit, respectively, a gate of the first transistor being connected to receive the input voltage signal and a gate of the second transistor being connected to receive the reference voltage; a capacitor connected as its one end to the first node and at its other end to a



second node; and a bias control circuit having an output connected to the second node and operating to respond to a precharge signal so as to bring the second node to a first level and to respond to the activation signal so as to bring the second node to a second level lower than the first level, so that the potential of the first node is consequentially lowered when the input buffer circuit executes the comparison operation in response to the activation signal and a current flowing through the first and second transistors is blocked by the capacitor.

4,943,739

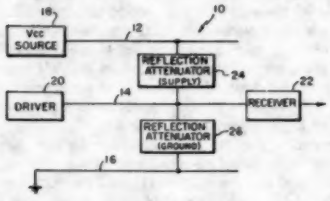
NON-REFLECTING TRANSMISSION LINE TERMINATION

Grimes G. Slaughter, 240 N. Purdue Ave., Apt. 211, Oak Ridge, Tenn. 37830

Filed Dec. 19, 1988, Ser. No. 286,622

Int. Cl.[5] H03K *17/16, 3/01;* **H01P** *1/22, 1/26*

U.S. Cl. 307—443 **18 Claims**



1. A transmission line that receives digital signals from a driver and transmits said digital signals to a receiver comprising:

a signal line for carrying said digital signals adaptable to be connected at one end to said driver and at an opposite end to said receiver;

a first line for receiving a first potential;

a second line for receiving a second potential, said first and second potentials defining a predetermined potential range; and

means for clamping said digital signals on said signal line to a signal voltage at or near said first potential or said second potential to substantially prevent the signal from moving outside the predetermined potential range said clamping means comprising:

a first bipolar junction transistor having an emitter connected to said signal line and a base, through a first base resistor, connected to said ground line, and

a second bipolar junction transistor having an emitter connected to said signal line and a base, through a second base resistor, connected to said supply line.

4,943,740

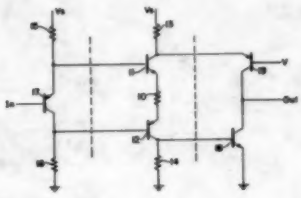
ULTRA FAST LOGIC

Zdzislaw Gulczynski, P.O. Box 441, Winchester, Mass. 01890

Filed Apr. 12, 1988, Ser. No. 180,431

Int. Cl.[5] H03K *19/096, 19/088*

U.S. Cl. 307—454 **21 Claims**



1. Logic apparatus providing differential binary output signal in response to differential binary input signal, comprising:

a pair of input terminals with the differential binary input signal applied thereacross;

a pair of output terminals with the differential binary output signal appearing thereacross;

a pair of transistors of opposite conductivity types, each having a base, emitter and collector electrodes,

wherein the base electrodes are separately coupled to the inputs, one emitter electrode provides a signal to the other emitter electrode in the absence of an input or output taken therefrom and the collector electrodes are separately coupled to the outputs; and

a pair of means for biasing the transistors, separately coupled to the collector electrodes thereof.

4,943,741

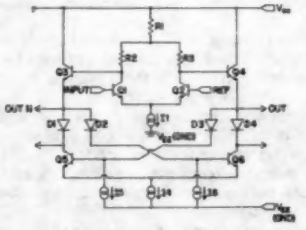
ECL/CML EMITTER FOLLOWER CURRENT SWITCH CIRCUIT

Julio R. Estrada, South Portland, and Roy L. Yarbrough, Hiram, both of Me., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 24, 1989, Ser. No. 356,785

Int. Cl.[5] H03K *19/086, 3/284*

U.S. Cl. 307—455 **9 Claims**



1. An improved emitter coupled logic or current mode logic (ECL/CML) circuit having a first active switching node providing true output signals of high and low potential, first emitter follower transistor means coupled to the first active switching node for sourcing said true output signals to a first output,

a second active switching node providing complementary output signals of low and high potential, second emitter follower transistor means coupled to the second active switching node for sourcing said complementary output signals to a second output, and output current sink means operatively coupled for sinking current from the first and second outputs and first and second emitter follower transistor means, the improvement comprising:

an emitter follower current switch circuit comprising a first current switch transistor element operatively coupled between the first emitter follower transistor means and the output current sink means and a second current switch transistor element operatively coupled between the second emitter follower transistor means and said output current sink means;

a first control circuit arranged and coupled for controlling the conducting state of the first current switch transistor element so that it is on and off for true output signals of low and high potential respectively, said first emitter follower transistor means and output thereby being substantially disconnected from the output current sink means when the first output is at high potential;

a second control circuit arranged and coupled for controlling the conducting state of the second current switch transistor element so that it is on and off (non conducting) for true output signals of high and low potential respectively, said second emitter follower transistor means and second output thereby being substantially disconnected from the output current sink means when the second output is at high potential;

said first control circuit comprising a first potential difference circuit element operatively coupled between the emitter node of the second emitter follower transistor means and the base node of the first current switch transistor element and said second control circuit comprising a second potential difference circuit element operatively coupled between the emitter node of the first emitter follower transistor means and the base node of the second current switch transistor element.

4,943,742

SCHOTTKY BARRIER DIODE CLAMP TRANSISTOR

Toshitaka Fukushima, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 66,746, Jun. 3, 1987, abandoned. This application Apr. 4, 1989, Ser. No. 333,756

Claims priority, application Japan, Oct. 3, 1985, 60-219171

Int. Cl.[5] H03K *19/013, 19/088, 19/092, 19/084*

U.S. Cl. 307—458 **5 Claims**

1. A semiconductor device used for a logic circuit including a Schottky.barrier.diode clamping transistor, comprising:

a buried layer of a first conductivity type having a first impurity concentration;

a collector layer of the first conductivity type on said buried layer, said collector layer having a second impurity concentration which is lower than the first impurity concentration, said collector layer further having a doped contact region of a third impurity concentration higher than the second impurity concentration, said doped contact region being formed between said buried layer and the surface of said collector layer;

a base region of a second conductivity type which is opposite to the first conductivity type, said base region being formed at the surface of said collector layer;

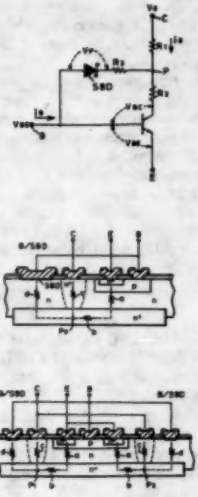
an emitter region of the first conductivity type formed in the base region;

an emitter electrode formed on said emitter region;

a base electrode formed on said base region;

a collector electrode formed on said doped contact region of said collector layer; and

a Schottky contact formed on a portion of said collector layer having the second impurity concentration, said Schottky contact being coupled to said base electrode, a third resistance extending from said Schottky contact through said collector layer, a first resistance extending from said collector contact through said doped contact region to a point in said buried layer, and a second resistance extending from a PN junction between said base



region and said collector layer under said emitter region through the collector layer to the point in said buried layer, said first resistance being smaller than said second resistance.

4,943,743

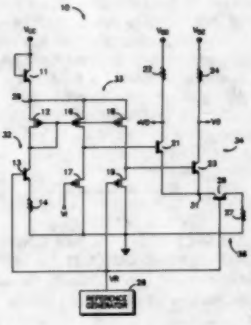
TTL TO ECL INPUT BUFFER

Perry H. Pelley, III, and Ruey J. Yu, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 24, 1988, Ser. No. 172,515

Int. Cl.[5] H03K *19/092, 19/02, 3/01*

U.S. Cl. 307—475 **13 Claims**



1. An input buffer comprising:

a first transistor having a first current electrode coupled to a first power supply terminal, a control electrode for receiving an input signal, and a second current electrode;

a second transistor having a first current electrode coupled to the first power supply terminal, a control electrode for

receiving a reference voltage, and a second current electrode;

a current reference generator for generating a reference current and providing a load signal indicative of the reference current;

a first load transistor having a first current electrode coupled to the second current electrode of the first transistor, a control electrode for receiving the load signal, and a second current electrode coupled to a second power supply terminal;

a second load transistor having a first current electrode coupled to the second current electrode of the second transistor, a control electrode for receiving the load signal, and a second current electrode coupled to the second power supply terminal; and

a differential amplifier having a first input coupled to the second current electrode of the first transistor, a second input coupled to the second current electrode of the second transistor, and first and second outputs representative of a voltage differential between the first and second inputs.

4,943,744

DIFFERENTIATING LOGICAL CIRCUIT FOR ASYNCHRONOUS SYSTEMS

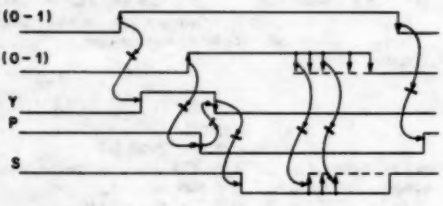
Angelo Beltramini, Galliate, Italy, assignor to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 370,155, Jun. 22, 1989, abandoned, which is a continuation of Ser. No. 165,908, Mar. 9, 1988, abandoned. This application Dec. 14, 1989, Ser. No. 449,428

Claims priority, application Italy, Mar. 11, 1987, 19648 A/87

Int. Cl.[5] H03K *17/04*

U.S. Cl. 307—480 **48 Claims**



1. A digital logic circuit comprising:

means for receiving at least one input signal X;

means connected to said receiving means and responsive to a change of logic level of said at least one input signal X to produce a change of logic level in an output signal Y from a rest logic level to another logic level;

means for receiving at least one feedback signal F from a circuit utilizing said output signal Y; and

means connected to said feedback signal receiving means and responsive to a change of logic level in said feedback signal F to return said output signal Y back to said rest logic level.

4,943,745

DELAY CIRCUIT FOR SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES

Yohji Watanabe, Kawasaki, and Takashi Ohsawa, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 275,386, Nov. 23, 1988, abandoned. This application Nov. 16, 1989, Ser. No. 437,294

Claims priority, application Japan, Nov. 25, 1987, 62-296816

Int. Cl.[5] H03K *5/159*

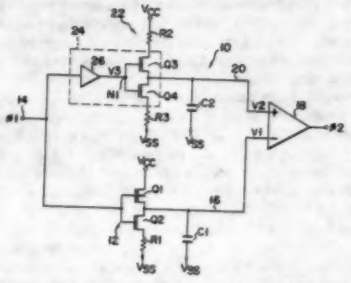
U.S. Cl. 307—603 **28 Claims**

1. A delay circuit for a semiconductor integrated circuit device, comprising:

(a) first circuit means for receiving an input signal and for selectively executing charging/discharging in response to said input signal to thereby produce a variable output voltage;

(b) second circuit means for receiving a source voltage of said device and for dividing said source voltage to thereby produce a voltage having a predetermined constant potential as a reference voltage;

(c) third circuit means, having first and second inputs respectively coupled to said first and second circuit means, for



comparing said output voltage of said first circuit means with said reference voltage;

(d) fourth circuit means for receiving said input signal and performing a switching operation in response to said input signal to electrically disconnect said second input of said third circuit means from said second circuit means; and

(e) fifth circuit means for maintaining said reference voltage at said second input of said third circuit means while said third circuit means is being disconnected from said second circuit means.

4,943,746

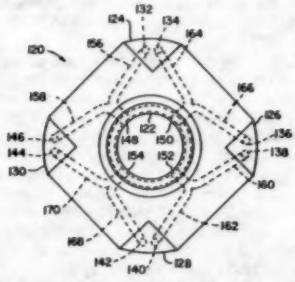
LIQUID COOLED SALIENT POLE ROTOR SUPPORT WEDGES

William M. Scherzinger, Brick; Tsuwei Chu, Oceanport, and Leon M. Kasdan, West Long Beach, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 20, 1989, Ser. No. 326,149

Int. Cl.[5] H02K *1/32*

U.S. Cl. 310—61 **25 Claims**



19. A method for dissipating heat in a generator having an axially bored shaft, a rotor mounted on the bored shaft having a plurality of poles, and a plurality of support wedges positioned between each of the plurality of poles, at least two of the plurality of support wedges having a bore, comprising the steps of:

transferring a cooling medium through the shaft;

transferring the cooling medium from the shaft through the bore in at least one of the plurality of support wedges having the bore:

circulating the cooling medium from each of the plurality of support wedges receiving the cooling medium from the

shaft to at least one other of said plurality of support wedges; and

returning the cooling medium to the shaft.

4,943,747

BRUSHLESS UNEQUAL POLES CONTROLLED ELECTRIC MOTOR

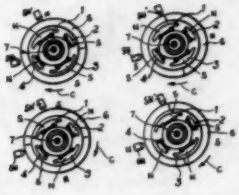
Jong-Seob Lee, Jinju Apartment No. 5-1305, Gazoe-dong 30-2, Seo-ku, InChon, Rep. of Korea, assignor to Woo-Jin Kim, Seoul and Jong-Seob Lee, Inchon, both of, Rep. of Korea

Filed May 5, 1989, Ser. No. 347,999

Claims priority, application Rep. of Korea, Sep. 12, 1988, 11757/1988[U]; Sep. 12, 1988, 11758/1988[U]

Int. Cl.[5] H02K *29/08, 3/18;* **H02P** *1/22*

U.S. Cl. 310—67 R **11 Claims**



1. A brushless unequal-pole electric motor comprising:

a hollow cylindrical rotor rotatably mounted within a casing and including a permanent magnet having at least two magnetic pole;

a plurality of field magnetic cores provided with field coils and located arcuately within and fixedly attached to said casing for generating magnetic fields of different magnitudes between adjacent ones of said field magnetic cores, and for generating magnetic fields of the same magnitude between oppositely located ones of said field magnetic cores;

magnetic sensors located within said casing, each said sensor being arcuately spaced from a longitudinal axis of an adjacent one of said field magnetic cores for detecting the positions of the magnetic poles of said permanent magnet of said rotor; and

a driving circuit connected to said magnetic sensors and to said field coils for reversing the magnetic polarity of said field magnetic cores in response to said magnetic sensors which detect the magnetic position of said permanent magnet of said rotor.

4,943,748

MOTOR WITH CUP-SHAPED ROTOR HAVING CYLINDRICAL PORTIONS OF DIFFERENT DIAMETER

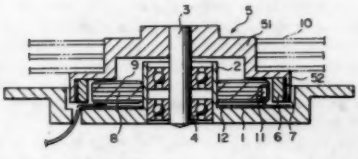
Shinichi Shiozawa, Komagane, Japan, assignor to Yugen Kaisha Chubuseimitsu, Nagano, Japan

Filed Jun. 22, 1989, Ser. No. 369,990

Claims priority, application Japan, Jul. 16, 1988, 63-176245

Int. Cl.[5] H02K *21/24;* **G11B** *5/012*

U.S. Cl. 310—67 R **14 Claims**



1. A motor structure comprising a frame wall and a hollow holding cylinder extending generally perpendicular from said frame wall, a rotor shaft coaxially disposed in said hollow holding cylinder, said rotor shaft having an axis of rotation which is vertically disposed, bearing means mounted on said hollow holding cylinder for rotatably supporting said rotor shaft, said holding cylinder having an outer part, coil means mounted on said outer part of said holding cylinder, a cup-shaped rotor means mounted on said rotor shaft, said cup-shaped rotor means having an end wall, a first cylindrical portion extending coaxially from said end wall, an intermediate wall extending radially outwardly from said first cylindrical portion, and a second cylindrical portion extending axially from said intermediate wall such that said first cylindrical portion has a diameter which is less than the diameter of said second cylindrical portion, said coil means being generally axially aligned with and being disposed radially inwardly of said second cylindrical portion, said coil means having an outer diameter greater than the diameter of said first cylindrical portion such that said coil means generally underlies said first cylindrical portion, and magnet means mounted on said second cylindrical portion radially outwardly of said coil means.

4,943,749

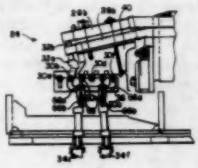
METHOD AND APPARATUS FOR CONDUCTING CURRENT FROM A DYNAMOELECTRIC MACHINE

Hector O. Ponce, Pensacola, and Aleksandar Prole, Winter Springs, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1988, Ser. No. 288,369

Int. Cl.[5] H02K *3/50, 1/18*

U.S. Cl. 310—260 **16 Claims**



1. A dynamoelectric machine, comprising:

a cylindrical stator core;

a casing structure surrounding said stator core, said casing structure having an opening of predetermined size at an axial end of said stator core;

a stator winding wound upon said stator core, said stator winding including a plurality of coils with each said coil having two terminating ends and means for circulating a fluid coolant therethrough;

means for supporting said stator winding at said terminating ends, said supporting means being mountable to said stator core at said axial end;

a plurality of conducting rings, mounted radially outward from said terminating ends upon said supporting means, each said conducting ring having means for circulating said fluid coolant therethrough and tab means for conducting current therefrom;

phase lead extension means for electrically coupling said terminating ends to said conducting rings;

a plurality of main leads for conducting current externally from the dynamoelectric machine; and

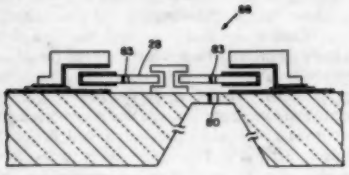
main lead extension means for electrically coupling each said main lead to a preselected one of said tab means;

wherein said conducting rings mounted upon said supporting means are insertable in the dynamoelectric machine through said opening in said casing structure.

4,943,750
ELECTROSTATIC MICROMOTOR

Roger T. Howe, Belmont; Jeffrey H. Lang, Waltham; Martin F. Schlecht, Lexington; Martin A. Schmidt, Brookline, and Stephen D. Senturia, Boston, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 52,725, May 20, 1987, abandoned. This application Jul. 3, 1989, Ser. No. 376,208
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—309 27 Claims

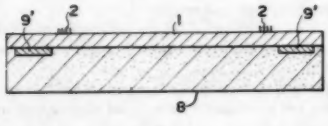


1. An electrostatic machine comprising:
a stator formed by surface micromachining sacrificial layers on a substrate surface;
a moveable member positioned for movement relative to the stator free of contact thereto, the moveable member formed and positioned with respect to the substrate surface during the surface micromachining that formed the stator;
means for generating and sustaining an electrostatic field about the moveable member across a gaseous gap between the stator and moveable member, facing surfaces of the surface micromachined stator and moveable member across the gaseous gap being free of contact with each other and sufficiently smooth to support a field strength above about 10^8V/m without electrostatic breakdown, the distance between the stator and moveable member across the gaseous gap being about 5 micrometers or less.

4,943,751
SURFACE ACOUSTIC WAVE ELEMENT

Syuichi Mitsutsuka, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1989, Ser. No. 368,787
Claims priority, application Japan, Jun. 28, 1988, 63-162250
Int. Cl.[5] H04L *41/08*
U.S. Cl. 310—313 D 5 Claims

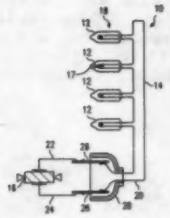


1. A surface acoustic wave element comprising:
a first conductivity type semiconductor substrate;
a piezoelectric layer formed on said semiconductor substrate;
at least one interdigital electrode disposed on said piezoelectric layer; and
a second conductivity type semiconductor region disposed at a position on the side of the end surface of said substrate, viewed from said interdigital electrode, in the upper surface portion just below said piezoelectric layer.

4,943,752
PIEZOELECTRIC INCANDESCENT LAMP TEST DEVICE

Philip A. Todd, 11456 Dumbarton Dr., Dallas, Tex. 75228, and Bobby R. Walker, 1300 Lansdowne Dr., Arlington, Tex. 76012

Filed Sep. 8, 1988, Ser. No. 241,882
Int. Cl.[5] H01L *41/08*; G01R *31/22*
U.S. Cl. 310—339 2 Claims

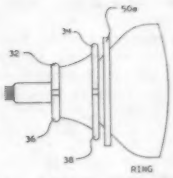


1. A piezoelectric incandescent lamp test device, the incandescent lamp being tested having a filament, comprising:
a piezoelectric electric crystal;
means for electrically connecting the piezoelectric crystal to the incandescent lamp under test to conduct a voltage generated at the piezoelectric crystal to the incandescent lamp, a break in the continuity of the filament in a lamp causing an arc across a broken filament in a lamp to provide a visual indication of the broke filament.

4,943,753
MAGNETIC SHUNT FOR DEFLECTION YOKES

Joseph F. Hevesi, West Hurley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 84,949, Aug. 13, 1987, abandoned. This application Oct. 31, 1988, Ser. No. 265,115
Int. Cl.[5] H01J *29/70*; H01H *5/00*
U.S. Cl. 313—440 11 Claims



1. In a cathode ray tube display device having a screen for viewing, means for producing a charged particle beam directed at said screen from the rear thereof and aligned with a central axis and a deflection coil yoke having a magnetic component from axially aligned wired segments and a magnetic component from circumferentially aligned wire segments relative to said axis and ferrite core about said deflection coil, giving rise to a desired deflection field for deflecting said beam and an undesirable net distributed magnetic far field radiation outside said device which resembles a vertically oriented dipole field whose mathematical center lines on the central axis slightly ahead of the yoke, apparatus for reducing said net distributed magnetic far field radiation in front of said screen and all about said device, while minimizing the effect within said tube, comprising:
a substantially complete ring of magnetically permeable material with at most only narrow non-magnetic gaps, said ring substantially centered on said central axis totally disposed between end turns of said coil and said screen,

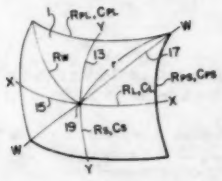
said ring positioned near and spaced from said end turns of said coil with the thickness, internal diameter and outer diameter, permeability and separation between the coil yoke and ring being determined to minimize said undesirable net distributed magnetic far field radiation in front of said screen and all about the outside of said device while having minimum effect within the tube.

4,943,754

COLOR PICTURE TUBE WITH FLAT APPEARING FACE PLATE

Ryoji Hirai; Mitsuru Yoshizawa, and Hiroyuki Ikeda, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 277,946
Claims priority, application Japan, Dec. 2, 1987, 62-303105
Int. Cl.[5] H01J *31/00*
U.S. Cl. 313—477 R **2 Claims**



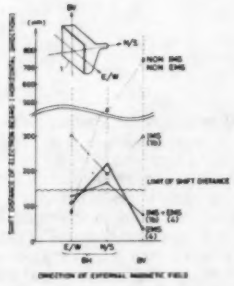
1. A color picture tube of the shadow mask type comprising a rectangular faceplate panel constituted by a rectangular faceplate which has an outward convex central portion, an outer periphery and curvatures C_L and C_S along major and minor axes of said rectangular faceplate, said rectangular faceplate being formed so that at least in the periphery of said rectangular faceplate, a curvature C_{PL} at a long side peripheral portion is made larger than a curvature C_{PS} at a short side peripheral portion by a value within a range of 10% to 100%.

4,943,755

MAGNETIC SHIELDING WITH CONSTANT-CURRENT COILS FOR CRT

Masayuki Toshiyasu; Kazuhiro Chihara, and Yasuo Iwasaki, all of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1986, Ser. No. 864,659
Claims priority, application Japan, May 20, 1985, 60-107294; Jun. 17, 1985, 60-133758
Int. Cl.[5] H04N *9/29*; H01J *29/06*
U.S. Cl. 315—8 **10 Claims**



1. A magnetic shield apparatus for use in shielding a cathode ray tube of a television receiver, said cathode ray tube having a funnel part and a panel part at a viewing side of said cathode ray tube with substantially flat sides, said apparatus comprising:

an external magnetic shielding case substantially enclosing said funnel and major side portions of said panel part of said cathode ray tube;

a toroidal magnetic cancelling coil applied with a constant current for cancelling an external magnetic field along a central axis of said cathode ray tube, wherein said toroidal magnetic cancelling coil is wound around said cathode ray tube; and

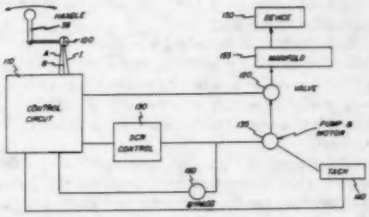
a pair of magnetic cancelling coils applied with a constant current for cancelling an external magnetic field along major side portions of said panel part, being positioned on opposed sides of said cathode ray tube, and being arranged between said cathode ray tube and said external magnetic shielding case.

4,943,756

CONTROL OF HYDRAULIC SYSTEMS

Walter Conley, III, and Kim A. Klopfleisch, both of St. Marys, Ohio, assignors to Crown Equipment Corporation, New Bremen, Ohio

Filed Dec. 5, 1989, Ser. No. 446,274
Int. Cl.[5] G05B *11/01*; H02P *7/00*
U.S. Cl. 318—671 **13 Claims**



1. In an apparatus for supplying a controlled hydraulic pressure and flow to a utilization device, said apparatus includes

a control handle moveable through a predetermined distance,

a hydraulic pump, an electric motor for driving said pump to supply hydraulic fluid under pressure, and a hydraulic valve responsive to the position of said control handle for controlling the flow of hydraulic fluid to the utilization device, the improvement comprising

means for sensing the position of said control handle,

means responsive to said sensing means for controlling the speed of said pump motor, said controlling means including

means for establishing and maintaining a minimum pump motor speed, and

circuit means for controlling said pump motor speed as said control handle is operated in an intermediate position.

7. A method for controlling the application of hydraulic pressure and flow from a motor driven pump through a hydraulic control valve to a utilization device in response to the position of a control handle, said method including the steps of

establishing and maintaining a minimum pump motor speed,

controlling said hydraulic control valve through which hydraulic pressure and flow is supplied to the utilization device by means of said handle wherein, as said handle is moved from an off to an intermediate position, said valve will progress from a fully closed position to a fully open position, and

controlling said pump motor speed further to control hydraulic flow in response to movement of said handle from

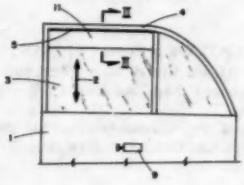
an intermediate position, prior to said valve becoming fully open, to an on position.

4,943,757

SAFETY APPARATUS FOR A MOTOR DRIVEN WINDOW

Siegfried Richter, Eckental-Eckenhaid; Friedrich Schauer, Heroldsberg, and Peter Bauernfeind, Nuremberg, all of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Filed May 23, 1989, Ser. No. 355,471
Claims priority, application Fed. Rep. of Germany, May 31, 1988, 3818456
Int. Cl.[5] E05F 15/08; H02P 1/22
U.S. Cl. 318—468 2 Claims



1. Safety apparatus for a motor driven window of an automotive vehicle, comprising:

A vehicle outer wall including a window aperture;

a motor driven window slidably positioned within said outer wall and movable in a first direction toward a first side of said window aperture to assume a closed position, and movable in a second opposite direction to assume an open position;

a piezoelectric cable extending substantially across the width of said window aperture and along said first side of said window aperture for generating electrical pulses upon an obstruction extending through said window aperture being pushed against said piezoelectric cable; and

an electric motor coupled to said motor driven window for movement in said first direction upon rotation of said electric motor in a first direction, and movement in said second opposite direction upon the reversal of direction of rotation of said electric motor, said electric motor being connected to said piezoelectric cable so as to be responsive to an electrical pulse generated thereby for reversing the direction of rotation of said electric motor upon said obstruction being pushed against said piezoelectric cable.

4,943,758

STEERING CONTROL APPARATUS FOR A MOTOR VEHICLE WITH STEERABLE FRONT AND REAR WHEELS

Osamu Tsurumiya, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1988, Ser. No. 246,412
Claims priority, application Japan, Sep. 17, 1987, 62-232969
Int. Cl.[5] H02P 7/14; B62D 5/04
U.S. Cl. 318—504 7 Claims

1. A steering control apparatus for a motor vehicle with steerable front and rear road wheels, comprising:

a steering mechanism for turning the rear road wheels as well as the front road wheels in response to the turning of a steering wheel;

a battery mounted on the motor vehicle;

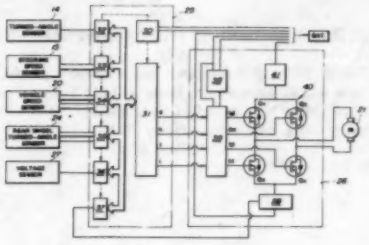
an electric motor energizable by electric power supplied from said battery for applying power output to said steering mechanisms;

detecting means for detecting the voltage of said battery; and

a motor control unit for controlling operation of said electric motor, said motor control unit comprising:

determining means for determining a control signal for said electric motor;

correcting means for correcting said control signal with a battery voltage detected by said detecting means such that



the power output of said electric motor will be maintained at a desired level despite variations in the battery voltage; and

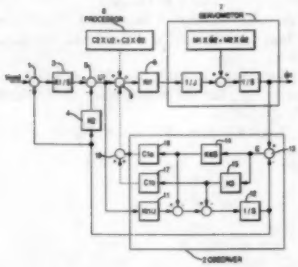
driver means for energizing said electric motor by supplying the electric motor with the electric power from the battery based on said corrected control signal.

4,943,759

MULTIPLE-ARTICULATED ROBOT CONTROL APPARATUS

Keiji Sakamoto, Hachioji, and Osamu Yoshida, Oshino, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP88/00604, § 371 Date Jan. 27, 1989, § 102(e) Date Jan. 27, 1989, PCT Pub. No. WO88/10452, PCT Pub. Date Dec. 29, 1988
PCT Filed Jun. 17, 1988, Ser. No. 305,869
Claims priority, application Japan, Jun. 18, 1987, 62-150205
Int. Cl.[5] G05B 5/00
U.S. Cl. 318—568.11 2 Claims



1. A control apparatus for a multiple-articulated robot in which each arm is independently driven by a feedback-controlled joint driving servomotor, comprising:

arithmetic means for computing mutual interference torque values for respective ones of the arms;

status observing means for reproducing a status variable from a torque command and actual velocity of each servomotor, said status observing means including:

constant term means for receiving an acceleration value and converting it to a constant term;

integration means, connected to said converting means, for receiving and converting the constant term value to a velocity value;

a first adder, connected to the servometer and said inte-

gration means, for calculating an error having a steady component and a non-steady component;
error elimination means, connected to said first adder, for eliminating the steady error component; and
torque means, connected to said error elimination means, for providing corrective torque to the non-steady error component from said error elimination means;
a second adder, connected to said corrective means, for adding the outputs from said torque means;
conversion means, connected to said status observing means, for receiving the velocity value from said integration means and for converting an output of the status observing means into a corrective value of torque produced by disturbance acting upon the servomotor; and
correcting means, connected to said conversion means and said second adder, for receiving the output from said second adder and the corrective value and for correcting an error signal of the torque command of the servomotor by the converted corrective value and said interference torque value.

4,943,760

CONTROL SYSTEMS FOR VARIABLE RELUCTANCE ELECTRICAL MACHINES

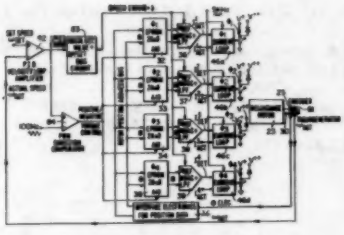
John V. Byrne, Dalkey; Francis McMullin, Ennis; Francis Devitt, Glasnevin; Jeremiah O'Dwyer, Naas; John Murphy, Bishopstown; Michael Egan, Wilton; Michael Brosnan, Ennis, and James Lawton, Midleton, all of Ireland, assignors to Kollmorgen Corporation, Simsbury, Conn.

Continuation of Ser. No. 788,856, Oct. 18, 1985, abandoned. This application Nov. 2, 1988, Ser. No. 266,482

Claims priority, application Ireland, Oct. 19, 1984, 2697/84; Oct. 19, 1984, 2698/84; Oct. 19, 1984, 2699/84; Apr. 16, 1985, 957/85

Int. Cl.[5] H02P *5/40*

U.S. Cl. 318—701 **7 Claims**



1. A control system for a variable reluctance electrical motor having a driving member and a driven member displacable relative to the driving member, said driving member having a plurality of poles and each of said plurality of poles having a winding, the control system comprising
(a) power supply means,
(b) driven member position-sensing means, and
(c) means for producing a demand signal indicative of a desired level of a parameter of motor performance;
said driven member position-sensing means generating at least one signal having an instantaneous value providing an instantaneous indication of driven member position relative to an origin position for each of a multiplicity of successive positions of the driven member relative to the driving member;
the power supply system including voltage source means and current regulating means;
said current regulating means being responsive to said at least one driven member position-sensing means signal to connect said driving member pole windings across said voltage source means in a predetermined sequence during displacement of the driven member and to connect each of said driving member pole winnings across said voltage source means for unidirectional current flow therethrough for a predetermined increment of driven member displacement, said predetermined increment of driven member displacement corresponding to a displacement of the driven member relative to the driving member between a position of maximum reluctance for at least one driven member pole and a cooperating driving member pole and an aligned position of minimum reluctance of said at least one driven member pole and said cooperating driving member pole and comprising a plurality of said multiplicity of successive positions of the driven member relative to the driving member;
said current-regulating means including means for generating a relative current magnitude signal and means for forcing current in a driving pole winding connected to said voltage source means to track said relative current magnitude signal;
said means for generating a relative current magnitude signal being responsive to said at least one driven member position-sensing means signal to generate an instantaneous value of said relative current magnitude signal for each of said plurality of said multiplicity of successive positions of the driven member within said predetermined increment of driven member displacement;
and said current-forcing means being responsive to both said relative current magnitude signal and to said demand signal;
said current-forcing means being responsive to said relative current magnitude signal to regulate the instantaneous magnitude of said current in a driving member pole winding connected to said voltage source means so that the instantaneous value of said current at any one of said plurality of said multiplicity of successive positions of the driven member within said predetermined increment of driven member displacement relative to its value at any other of said plurality of said multiplicity of successive positions is substantially determined by said instantaneous value of said current magnitude signal corresponding to the instantaneous position of the driven member within said predetermined increment;
and said current-forcing means being responsive to said demand signal to regulate the instantaneous magnitude of said current so that the absolute value of said current at each of said plurality of said multiplicity of successive positions of the driven member within said predetermined increment of driven member displacement is substantially determined by the value of said demand signal.

4,943,761

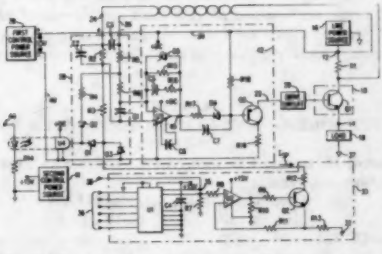
CURRENT LIMITED DC POWER CONTROLLER

David A. Fox, and William W. Billings, both of Lima, Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 6, 1988, Ser. No. 215,694

Int. Cl.[5] G05F *1/56*

U.S. Cl. 323—283 **7 Claims**



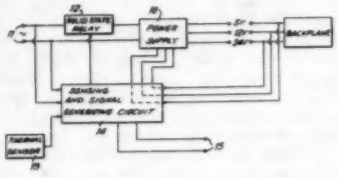
1. A current limited DC power controller comprising:

an output circuit stage having a controllable solid state switching device for conducting current between a pair of output terminals;
a drive circuit for controlling said solid state switching device in response to a control signal;
a programmable current source for producing a reference current signal in response to a command signal;
a first resistor for connection in series between a line voltage source and said programmable current source for producing a reference voltage signal, having a magnitude proportional to said command signal;
means for clamping said reference voltage to a preselected magnitude when the power controller is off;
means for producing a second voltage signal, having a magnitude proportional to current flowing through said output circuit stage;
means for combining said reference voltage signal and said second voltage signal to produce a difference signal; and
means for producing said control signal in response to said difference signal.

4,943,762
POWER SUPPLY SYSTEM

W. Carroll Campbell; Michael W. Evans, both of Longmont; Edward A. Browning, Jr., Louisville, and Robert J. Stone, Longmont, all of Colo., assignors to Cedar Technology, Inc., Longmont, Colo.

Filed Jan. 27, 1988, Ser. No. 149,116
Int. Cl.[5] G05F *1/56*
U.S. Cl. 323—284 **15 Claims**



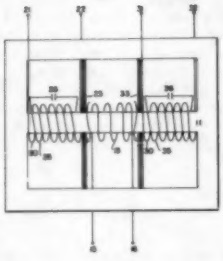
1. A sensing system for producing an output signal responsive to the drop of the amplitude of a cyclic voltage below a determined level, comprising a source of a cyclic signal, a timing circuit having an input circuit and an output terminal, a threshold circuit, means coupling said output terminal and said source to said threshold circuit as first and second inputs thereto, said threshold circuit being responsive to the sum of the voltage at said output terminal and the instantaneous voltage of said source above a first predetermined level for applying triggering signals to said input circuit of said timing circuit, said timing circuit comprising means responsive to said triggering signal for maintaining said output terminal at a level exceeding a second predetermined level for a predetermined time, whereby in the absence of the occurrence of a peak of said cyclic voltage exceeding a third predetermined level for said predetermined time the voltage at said output terminal assumes a level less than said second predetermined level.

4,943,763
FERRORESONANT TRANSFORMER WITH DUAL OUTPUTS

Howard H. Bobry, Edmonds, Wash., assignor to Albar, Inc., Lynnwood, Wash.

Filed Sep. 8, 1988, Ser. No. 241,889
Int. Cl.[5] G05F *3/06*; H01F *21/08*
U.S. Cl. 323—309 **1 Claim**

1. In a ferroresonant transformer having a core and a primary winding on said core adapted to be connected to a source of alternating current, the improvement which comprises:
a first secondary winding section on said core coupled to a first load;
first magnetic shunt means disposed between said primary winding and said first secondary winding section;
a first resonant winding connected to a ferrocapacitor and coupled to said first secondary winding section to regulate the voltage level supplied to said first load;
a second secondary winding section on said core coupled to a second load;

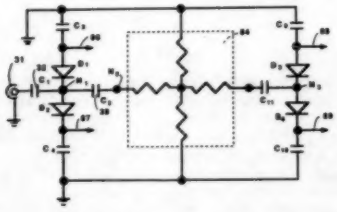


second magnetic shunt means disposed between said primary winding and said second secondary winding section; and
a second resonant winding connected to a ferrocapacitor and coupled to said secondary winding section to regulate the voltage level supplied to said second load;
whereby said first load is electrically and magnetically isolated from said second load.

4,943,764
WIDE DYNAMIC RANGE RADIO-FREQUENCY POWER SENSOR

Pedro A. Szente, Los Altos, and Russell B. Riley, Portola Valley, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 11, 1987, Ser. No. 131,867
Int. Cl.[5] G01R *15/10, 21/04*
U.S. Cl. 324—95 **32 Claims**



24. A wide dynamic range radio-frequency power sensor comprising:
an input port having one side grounded;
a first coupling capacitor connected to said input port;
a low power diode sensor portion connected to said first coupling capacitor through said first node;
a second node connected to said second coupling capacitor;
a high power diode sensor portion connected to said second coupling capacitor; and
first and second pairs of output members; said low power diode sensor portion comprising identical first and second diodes, both connected through said first node to said first coupling capacitor, said first diode being connected to ground through a third, grounded capacitor and to a first

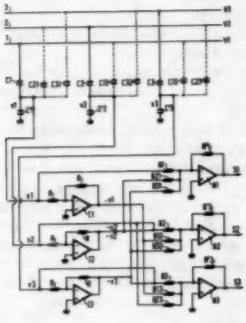
output member of said first pair, said second diode being connected to ground through a fourth grounded capacitor and to a second output member of said first pair, said high power diode sensor comprising identical third and fourth diodes connected to a third node, said third node being connected to said second node through a fifth capacitor and a resistive attenuator, said third diode being connected to grounded sixth capacitor and a first output member of said second pair, said fourth diode being connected to grounded seventh capacitor and to a second output-member of said second pair.

4,943,765

CIRCUIT FOR MEASURING VOLTAGES IN A THREE-PHASE INSTALLATION, IN PARTICULAR AN INSTALLATION OF THE METALCLAD TYPE

Jean-Pierre Dupraz, Lyons, and Jean-Paul Moncorge, Vaux En Velin, both of France, assignors to GEC Alsthom SA, Paris, France

Filed Aug. 31, 1989, Ser. No. 401,375
Claims priority, application France, Sep. 9, 1988, 88 11793
Int. Cl.[5] G01R *1/00*; H02H *3/00*
U.S. Cl. 324—107 **4 Claims**



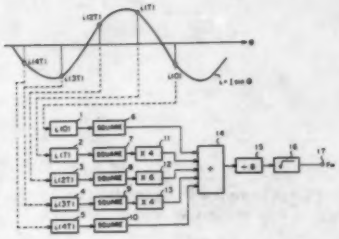
1. A circuit for measuring voltages in a three-phase installation, in particular an installation of the metalclad type, the circuit comprising for each of the phase conductors: a capacitive divider comprising a first capacitor connected firstly to, said conductor and secondly to a second capacitor (C'1, C'2, C'3) connected to ground, the circuit being characterized in that the voltage (v1, v2, v3) of each of the second capacitors (C'1, C'2, C'3) of the dividers is respectively applied firstly to the input of an inverter (I1, I2, I3) and secondly via a first resistance (R1, R2, R3) to the negative input of an operational amplifier (A1, A2, A3) which is also connected via second and third resistances (R21, R12, R13, and R31, R32, R23) respectively to the outputs of the inverters on the other two phases, with the resistances being selected in such a manner that when only one of the phases is under tension, then the output voltages from the operational amplifiers corresponding to the other phases are zero, with the output voltages from the amplifiers (A1, A2, A3) being, after said adjustment, respectively proportional to the voltages of the conductors.

4,943,766

ELECTRIC QUANTITY DETECTING METHOD

Sunao Suzuki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1989, Ser. No. 363,166
Claims priority, application Japan, Nov. 16, 1988, 63-290701
Int. Cl.[5] G01R *29/00*; H02H *3/00*
U.S. Cl. 324—132 **3 Claims**



1. An electric quantity detecting method comprising the steps of:

sampling an AC electric quantity of an electric system at a period T equal to ¼ of the period of the rated frequency of said AC electric quantity and obtaining a sampling value;

converting said sampling value from an analog value into a digital value; and

performing operation processing based on the digitized sampling value and detecting the amplitude value of the AC electric quantity of said electric power system,

wherein said sampling values are given as y(t), y(t−T), y(t−2T), y(t−3T), y(t−4T) obtained in said sampling step at times t−nT (n=0, 1, 2, 3, 4) apart from the present sampling time t by the prescribed sampling number n, and the operation processing in the operation processing step is performed in accordance with the following formula

$$Y=[\tfrac{1}{4}\{y(0)^2+4\{y(T)^2+y(3T)^2\}+6\cdot y(2T)^2+y(4T)^2\}]^{\frac{1}{2}}$$

and the amplitude value Y of the AC electric quantity is detected.

4,943,767

AUTOMATIC WAFER POSITION ALIGNING METHOD FOR WAFER PROBER

Keiichi Yokota, Nirasaki, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Feb. 27, 1989, Ser. No. 316,142
Claims priority, application Japan, Aug. 21, 1986, 61-193967
Int. Cl.[5] G01R *31/02*; H64N *7/18*
U.S. Cl. 324—158 F **5 Claims**

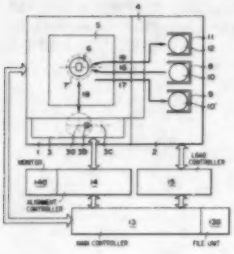
5. An automatic alignment method for a probe, comprising the steps of:

performing θ alignment of a new type of object to be tested, on an alignment portion, bringing a probe tip of a probe card into contact with a pad of said object, and detecting a mark made by said probe tip, thereby to ascertain the position of said probe tip, and designating data related to the ascertained position as standard probe tip position data corresponding to the type of object tested;

determining the amount of correction between a test position of said object and the position of said probe tip, determining at least two coordinates pertaining to the test position of said object, and determining the coordinates as data representing the position of said probe tip for θ alignment of the probe card; and

filing, as data corresponding to the type of the object tested,

said standard probe tip position data, said probe tip position correction amount data, said probe tip position data



used for performing θ alignment of said probe card, and necessary parameters associated therewith.

4,943,768

TESTING DEVICE FOR ELECTRICAL CIRCUIT BOARDS

Kenichi Niki; Tohru Kokogawa; Akira Ishizu, and Hayato Takasago, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

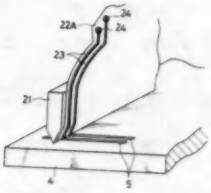
Continuation of Ser. No. 117,616, Nov. 6, 1987, Pat. No. 4,887,030. This application Jun. 21, 1989, Ser. No. 369,142

Claims priority, application Japan, Dec. 12, 1986, 61-297073

The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.

Int. Cl.[5] G01R *31/22, 1/06*

U.S. Cl. 324—158 F **2 Claims**



1. A testing device for testing an electric circuit board having test terminals thereon parallel to each other, the testing device comprising:

a resilient wedge-shaped pressing member having first and second opposite facing planar sides, and a pressing edge formed at the tapered termination of said first and second opposite planar sides of said pressing member,

a flexible, insulative base sheet including a first face region having conductor strips etched thereon in pattern corresponding to the test terminals on said electric circuit board,

said first face region being in contact with said pressing edge of said pressing member for effecting contact between said conductor strips on said first face region and said test terminals,

said flexible sheet having a second face region in contact with said first planar side of said pressing member,

said first face region being continuous with said second face region,

said conductor strips extending to outer peripheral edge on said second face region of said base sheet.

4,943,769

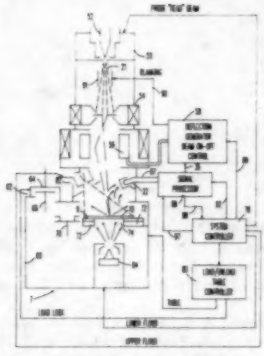
APPARATUS AND METHOD FOR OPENS/SHORTS TESTING OF CAPACITIVELY COUPLED NETWORKS IN SUBSTRATES USING ELECTRON BEAMS

Steven D. Golladay, Hopewell Junction; Fritz J. Hohn, Somers; David J. Hutson, Apalachin; William D. Meisburger, San Jose, and Juergen Rasch, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 21, 1989, Ser. No. 326,772

Int. Cl.[5] G01R *31/28;* H01J *37/26*

U.S. Cl. 324—158 R **5 Claims**



1. An electron beam testing system including:

(a) means for directing an electron beam at a sample having a conductive element thereon,

(b) charging means for electrically charging said conductive element on said sample,

(c) grid means for developing a positive charge for accelerating secondary electrons from said sample, said grid means comprising:

(1) lateral grid means located laterally with respect to said beam and said sample, and

(2) extractor grid means located above said sample;

(d) electrostatic deflection means located above said sample comprising elements for developing a negative charge for generating an electric field above said sample adjacent to said lateral grid means for deflecting secondary electrons generated on said sample laterally away from said beam and away from said sample and towards said lateral grid means.

4,943,770

DEVICE FOR ACCURATELY DETECTING THE POSITION OF A FERROMAGNETIC MATERIAL INSIDE BIOLOGICAL TISSUE

Charles Ashley-Rollman; Miles C. O'Donnell, both of Andover, and William McCormick, Carlisle, all of Mass., assignors to McCormick Laboratories, Inc., North Chelmsford, Mass.

Continuation of Ser. No. 40,614, Apr. 21, 1987, abandoned. This application Mar. 24, 1989, Ser. No. 328,443

Int. Cl.[5] G01B *7/14;* G01V *3/10;* A61B *5/06;* G01N *27/72*

U.S. Cl. 324—207.17 **21 Claims**

1. A device for accurately detecting at a specific limited distance the position of an object having ferromagnetic properties inside biological tissue, while being relatively insensitive to changes in external temperature and the like, comprising:

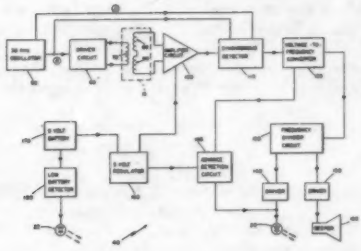
a probe having a primary winding and at least two secondary windings,

a means for producing an alternating output to activate said primary winding, said primary winding, when activated, generating a limited field which induces a.c. voltages in said secondary windings, said voltages in said secondary

windings being approximately equal and cancelling each other so that said probe has an approximately zero output voltage when the object to be detected is outside a specific limited distance from one of said secondary windings, but creating unequal voltages in said secondary windings which do not cancel each other so that said probe has a net alternating voltage when the object is within a specific limited distance from one of said secondary windings,

a detection means connected to said secondary windings for detecting any net alternating voltage from said probe, said detection means comprising a means for amplifying any such net alternating voltage from said probe, and a means for converting any such net alternating voltage as amplified by said means for amplifying to a d.c. voltage, the magnitude of which reflects the proximity of the object to one of said secondary windings,

a conversion means for converting the d.c. voltage from said means for converting, said conversion means comprising a voltage to frequency converter having a threshold voltage means which sets a level that must be exceeded by the d.c. voltage from said means for converting in order to produce an output signal from said conversion means thereby limiting the detection distance and providing insensitivity to external temperature,



said voltage to frequency converter including an error amplifier connected to an oscillator circuit having a pair of outputs, said outputs of said oscillator circuit being complementary and respectively connected to a pair of analog switches which form a servo loop with an input of said error amplifier so that said error amplifier compares each output of said oscillator circuit with the input received by said error amplifier from said means for converting,

one of said oscillator circuit outputs providing the output signal from said conversion means,

said means for converting further comprising a synchronous converter, said synchronous converter having first and second analog switches, each said switch being alternately triggered by a different, complementary output from said means for producing, said synchronous converter also having a first capacitor, said first capacitor being charged with the low voltage from any amplified net alternating output from said means for amplifying when said first analog switch is activated by a first output from said means for producing,

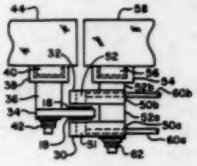
an alarm means which is activated by the output signal from said conversion means and a power source, said power source connected to said means for producing, said detection means and said conversion means.

4,943,771

DIFFERENTIAL EDDY CURRENT SENSOR MEASURING APPARATUS FOR USE WITH MOVABLE MIRROR SEGMENTS

Anthony N. Fuschetto, W. Redding, Conn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 19, 1989, Ser. No. 353,992
Int. Cl.[5] G01B 7/14
U.S. Cl. 324—207.18 **6 Claims**



1. A differential eddy current sensor apparatus comprising in combination:

means for oscillating, said oscillating means providing an exciting signal,

means for measuring, said measuring means receiving said exciting signal,

means for sensing, said sensing means operatively connected to said measuring means and comprising a first sensing coil and a second sensing coil, said first and second sensing coils being arranged in a parallel configuration and positioned a predetermined distance part, said target being positioned between said first and second sensing coils and spaced an equal distance away therefrom,

a target operatively arranged with said sensing means to establish an impedance level which may be sensed by said sensing means, said impedance level being balanced when said sensing means is in a predetermined alignment with said target, said sensing means providing a differential signal to said measuring means when said alignment between said target and said sensing means is disturbed, a first means for supporting said target, said first supporting means operatively attached to a first mirror segment, and a second means for supporting said first and second sensing coils, said second supporting means operatively connected to a second mirror segment.

and means for demodulating, said demodulating means operatively connected to said measuring means to receive said differential signal, said demodulating means amplifying and demodulating said differential signal to provide an analog output signal representative of the relative position of said mirror segments.

4,943,772

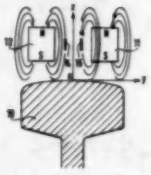
HALL EFFECT POSITION SENSOR FOR A RAILWAY VEHICLE AXLE

Jean-Louis Maupu; Hugues Chollet; Pierre Caroff, all of Arcueil, and Denis Dubot, Paris, all of France, assignors to Alshtom, Paris and Institut National de Recherche sur les Transports et Leur Securite, Arcueil, both of, France

Filed Apr. 18, 1989, Ser. No. 339,761
Claims priority, application France, Apr. 18, 1988, 88 05078
Int. Cl.[5] G01B 7/14; H01L 43/06
U.S. Cl. 324—207.2 **5 Claims**

1. A position sensor for measuring the separation, in a given direction, between a movable first part such as a datum element of a railway vehicle axle and a fixed second part such as a rail on which said axle runs, said sensor including first means for producing a magnetic field above second part having lines of the field substantially perpendicular to said direction when said separation is zero and penetrating said second part, said sensor being characterized in that it includes two Hall effect

probes (14, 15) secured to said first part proximate to said magnetic field producing means with their planes perpendicular to said direction (Oy) at a fixed distance (d) from each other an at the same height (ho) with respect to said second part, and carrying identical control currents, said sensor also including a circuit producing a signal



$$S1=(V1+V2)/(V1-V2)$$

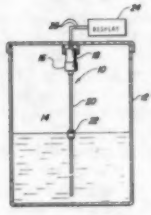
where V1 and V2 are the respective Hall voltages of said probes, said signal S1 being proportional to said separation.

4,943,773

MAGNETOSTRICTIVE LINEAR DISPLACEMENT TRANSDUCER HAVING PRESELECTED ZERO CROSSING DETECTOR

Richard D. Koski; William C. Kosco, both of Troy, and Arthur Dumais, Rochester, all of Mich., assignors to MagneTek Controls, Clawson, Mich.

Continuation of Ser. No. 100,535, Sep. 24, 1987, Pat. No. 4,839,590. This application Apr. 3, 1989, Ser. No. 332,771
The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.
Int. Cl.[5] G01B 7/14; G01F 23/30
U.S. Cl. 324—207.13 4 Claims



1. In a position transducer having a housing, a magnetostrictive wire disposed within the housing and mechanically anchored at opposite head and foot ends to define a position measurement range therebetween, a pulse generator for generating an actuation signal, an actuator connected to said pulse generator for imparting a torsional strain to the head end of the wire in response to said actuation signal, and a magnet disposed slidably mounted on the housing for linear displacement along said wire within said position measurement range thereby to produce an induced voltage in the wire upon the arrival of said torsional strain by propagation along said wire at the position of said magnet, the improvement comprising:

a circuit for producing a signal which is time positioned relative to the application of said actuation signal to the actuator according to the linear position of the magnet along the wire, said circuit including means responsive to said actuation signal to initiate a position measurement interval,

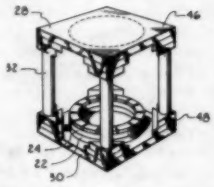
and means responsive to said induced voltage to terminate the interval upon a preselected zero crossing of said induced voltage.

4,943,774

MAGNETIC FIELD CONTROL APPARATUS

Bruce C. Breneman, San Diego; J. Wesley Parker, Escondido, and Raymond E. Sarwinski, San Diego, all of Calif., assignors to General Atomics, San Diego, Calif.

Filed Jun. 1, 1989, Ser. No. 360,028
Int. Cl.[5] G01R 33/20
U.S. Cl. 324—318 29 Claims



1. A magnetic field control apparatus for use in magnetic resonance imaging, comprising:

a frame having a first end plate, a second end plate facing said first end plate, and means for connecting said first end plate to said second end plate;

a pair of opposed, magnetic poles each mounted to facing surfaces of said first and second plates, respectively, and spaced apart to form a magnetic field therebetween;

a pair of substantially flat, parallel pole faces attached to the facing surface of each of said pair of opposed magnetic poles to form an air gap between said pole faces for establishing a flux field in said air gap; and

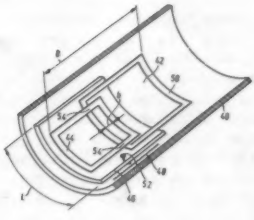
a plurality of segments movably mounted on the periphery of said pole face for adjustably controlling said flux field.

4,943,775

MAGNETIC RESONANCE APPARATUS WITH UNCOUPLED RF COILS

Eddy B. Boskamp, Shelton, Conn., and Wilhelmus R. M. Mens, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 117,003, Nov. 14, 1987, Pat. No. 4,859,947. This application Apr. 14, 1989, Ser. No. 339,030
Claims priority, application Netherlands, Nov. 27, 1986, 8603006; Apr. 20, 1988, 8801018
Int. Cl.[5] G01R 33/20
U.S. Cl. 324—322 21 Claims



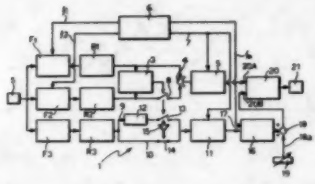
1. A magnetic resonance apparatus comprising a magnet system for generating a steady magnetic field, coil system for generating a gradient field, an rf transmitter coil and an rf coil system having coils overlapping each other partly for detection of magnetic resonance signals generated in an object, characterized in that successive detection coils overlap each other over such an area that mutual inductance between over lapping coils is reduced to a non-disturbing minimum.

4,943,776

DEVICE AND A METHOD FOR THE DETECTION OF PINKING IN OTTO ENGINES

Gino Polito, Voghera, and Franco Maloberti, Torre D'Isola, both of Italy, assignors to Marelli Autronica S.p.A., Milan, Italy

Filed Jun. 29, 1989, Ser. No. 372,968
Claims priority, application Italy, Sep. 15, 1988, 67819 A/88
Int. Cl.[5] F02P 17/00
U.S. Cl. 324—391 22 Claims



1. A device for detecting pinking in an internal combustion engine, which is intended to be connected to a sensor associated with the engine, the sensor generating a signal with a noise component and a useful signal component whose spectrum may have peaks indicative of the presence of pinking in a plurality of frequency ranges, including:

first and second monitoring means which are sensitive to the useful signal component in at least a first and a second of the frequency ranges and can generate first and second monitoring signals,

first comparator means which can compare the first and second monitoring signals and generate a logic signal which assumes a first value or a second value when the second monitoring signal reaches a given level relative to the first monitoring signal or is below the given level, respectively,

adding means which can be supplied with the first and second monitoring signals,

multiplier means which can be supplied with the noise component of the signal from the sensor,

second comparator means which have a first input and a second input and can generate a signal indicative of the presence of pinking when the signal at the first input exceeds the signal at the second input by a given factor and

switching means which are controlled by the logic signal an can assume a first operating position or a second operating position when the logic signal assumes the first value or the second value respectively, the switching means connecting:

the first and second monitoring signals to the adding means, the adding means to the first input of the second comparator means, the noise component to the multiplier means and the output of the multiplier means to the second input of the second comparator means in the first operating position, and

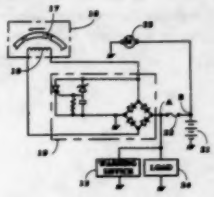
only the first monitoring signal to the first input of the second comparator means and the noise component to the second input of the second comparator means, in the second operating position.

4,943,777

BATTERY VOLTAGE WARNING DEVICE

Kazuhiro Nakamura; Tatsuya Yoshioka, both of Hamamatsu; Ryoji Sawada, Iwata, and Tomoji Nakamura, Iwata, all of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 262,528, Oct. 25, 1988, abandoned.
This application Dec. 2, 1989, Ser. No. 445,895
Claims priority, application Japan, Oct. 26, 1987, 62-259841
Int. Cl.[5] G01N 27/46
U.S. Cl. 324—433 6 Claims



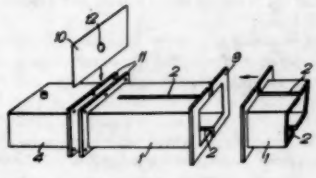
1. In a system for determining the condition of a battery in circuit with an internal combustion engine having a starter motor operated by the battery and generating means driven by the engine for maintaining a charge in the battery during the operation of said engine comprising first means for sequentially reading the voltage at first relatively short time periods, second means for sequentially reading the voltage at second relatively long time periods, and warning means for providing a battery condition warning signal in the event the first means senses a voltage below a first value during successive sampling cycles of the relatively short time period or in the event the second means senses a voltage below a second value which is higher than the first value during successive sampling cycles of the relatively long time period.

4,943,778

INSTRUMENT FOR MEASURING HIGH FREQUENCY CHARACTERISTICS OF SHEET-LIKE MATERIALS

Shigeyoshi Osaki, Takarazuka, Japan, assignor to Kanzaki Paper Manufacturing Co., Ltd., Japan

Filed Dec. 20, 1988, Ser. No. 287,442
Claims priority, application Japan, Dec. 21, 1987, 324980
Int. Cl.[5] G01N 22/00
U.S. Cl. 324—636 5 Claims



1. An instrument for measuring the high frequency characteristics of a sheet-like material comprising:

a pair of opposed slits formed in a pair of opposed tube walls of a cavity resonator having an optional cross-sectional shape, said slits extending parallel to a longitudinal tube axis and enabling a sheet-like material to be inserted such that it extends across said cavity resonator;

a driving section disposed at one end of said cavity resonator and having a driving conductor for producing microwaves for driving said cavity resonator to form an electric

field which is perpendicular to the tube wall surfaces formed with said pair of slits;

a detecting section disposed at the other end of said cavity resonator and having a probe conductor for receiving said microwaves;

a controlling and calculating device for detecting the resonant frequency or attenuation of received microwaves and calculating the high frequency characteristics of the sample from the detection result; and

wherein the cavity section of said cavity resonator is bisected at a halfway cross-section into two subsections, said slits are made in the form of longitudinal grooves extending from said subsections' bisected ends, and said subsections can be separated axially one from the other.

4,943,779

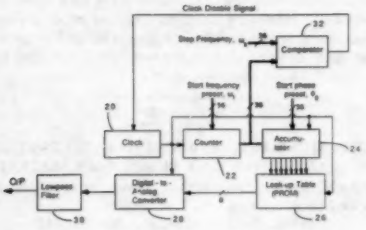
DIGITAL SWEEP GENERATOR

Peder C. Pedersen, Holden, and Thomas J. Green, Jr., Woburn, both of Mass., assignors to Worcester Polytechnic Institute, Worcester, Mass.

Filed May 19, 1988, Ser. No. 195,790

Int. Cl.[5] H03B *19/00*; H03K *17/00*

U.S. Cl. 328—14 **10 Claims**



1. A digital sweep generator for synthesizing a sweep signal of a predetermined periodic waveform swept through a range of frequencies, the generator comprising:

a counter for counting clock signals and providing a clock signal count;

means for setting the count from the counter to a value representative of an initial frequency of the sweep signal;

means for stopping the sweep signal after the clock signal count reaches a value representative of a predetermined stop frequency of the sweep signal;

a digital accumulator which sums successive clock signal counts from the counter for accumulating a count of clock signals as phase angle values of a sweep signal output as any of different selected sets of multiple bits;

a look-up table memory for receiving a selected set of multiple bits output from the accumulator and having stored therein values of a single cycle of the periodic waveform as a function of phase angle within a single cycle and responding to different selected sets of multiple bits output from the accumulator to vary sweep frequency of the sweep signal; and

a digital-to-analog converter coupled to receive and to convert to analog form stored values from the memory through successive cycles of the waveform.

4,943,780

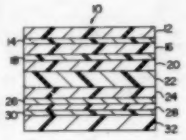
MULTI-LAYER SHEET STRUCTURE, METHOD OF MAKING SAME AND CONTAINERS MADE THEREFROM

Dwight D. Redding, Appleton, Wis., assignor to American National Can Company, Chicago, Ill.

Division of Ser. No. 657,003, Oct. 2, 1984, Pat. No. 4,659,408, which is a continuation-in-part of Ser. No. 614,878, May 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 482,350, Apr. 5, 1983, abandoned. This application Apr. 15, 1987, Ser. No. 38,605

Int. Cl.[5] B32B *1/08, 15/08*

U.S. Cl. 428—35.9 **33 Claims**



1. A paperless multi-layer sheet structure having two exterior heat sealable layers, comprising, in order:

(a) a first heat sealable layer on one of said exterior surfaces;

(b) a first adhesive layer;

(c) a layer of metal foil;

(d) a second adhesive layer;

(e) a layer of polyethylene or ethylene copolymer;

(f) a layer of uniaxially oriented polymer selected from the group, consisting of polypropylene, polyethylene, ethylene copolymer, polyethylene-polypropylene blend, nylon and polyester having an orientation ratio of about 2/1 to about 6/1; and

(g) a second heat sealable layer on the second of said exterior surfaces;

wherein said oriented polymer layer is disposed from about 0.2 to about 4.0 mils from said second exterior surface.

4,943,781

CYCLOTRON WITH YOKELESS SUPERCONDUCTING MAGNET

Martin N. Wilson, Abingdon, and Martin F. Finlan, Aylesbury, both of Great Britain, assignors to Oxford Instruments, Ltd., Oxford and Amersham International PLC, Little Chalfont, both of, Great Britain

Continuation of Ser. No. 80,470, Jul. 28, 1987, abandoned. This application Jul. 18, 1989, Ser. No. 382,035

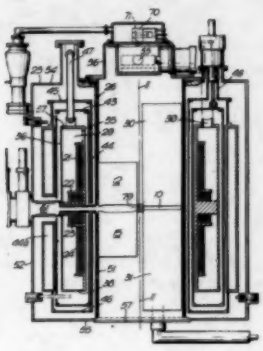
Claims priority, application United Kingdom, May 21, 1985, 8512804

Int. Cl.[5] H05H *13/00, 13/06*

U.S. Cl. 328—234 **12 Claims**

1. A cyclotron comprising a superconducting magnet having at least one cylindrical magnet coil arranged in a cryostat to provide a magnetic field extending axially of said coil, said cryostat defining an axial chamber having a substantially circular cross-section and containing said magnetic field, wherein said superconducting magnet provides yokeless means for generating said magnetic field, wherein interacting means are disposed in said chamber and arranged to interact with said magnetic field to provide a 'flutter' or variation of the axial magnetic field in the azimuthal direction in relation to said axis and to provide an isochronous variation of said axial magnetic field in the radial direction from said axis, wherein resonant cavity means are disposed in said chamber and arranged to provide an accelerating field for a beam of ionized particles, said interacting means and said resonant cavity means together defining a beam space disposed in the radial direction from said

axis in which said beam of ionized particles is accelerated, and wherein each said at least one cylindrical magnet coil defines



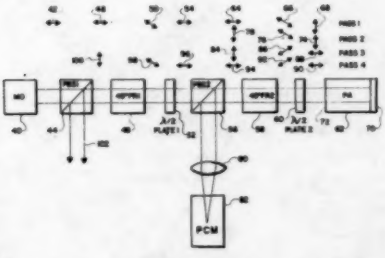
an internal radius greater than the radius defined by said beam space.

4,943,782

FOUR-PASS PHASE CONJUGATE OPTICAL AMPLIFIER SYSTEM AND METHOD

Ronald R. Stephens, Westlake Village; Richard R. Craig, Los Angeles; Huan W. Yen, Westlake, and Richard C. Lind, Woodland Hills, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 21, 1988, Ser. No. 170,957
Int. Cl.[5] H01S *3/98*
U.S. Cl. 330—4.3 **39 Claims**



1. A four-pass phase conjugate optical power amplifier system, comprising:

a polarized optical beam source,

a bidirectional power amplifier for an optical beam emitted from the optical beam source, wherein said power amplifier comprises a diode laser structure,

a phase conjugate mirror (PCM), and

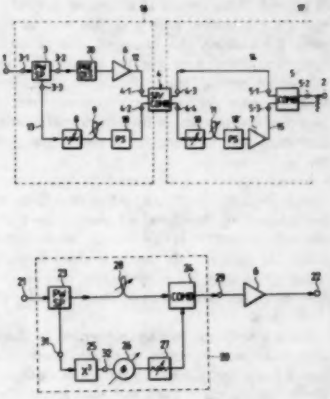
optical means for directing a polarized optical beam from the beam source in sequence through first and second passes through the power amplifier, to the PCM for phase conjugation thereby, and through third and fourth passes through the power amplifier, said optical means maintaining the beam's polarization substantially the same during said first and second amplifier passes, and substantially the same during said third and fourth amplifier passes.

4,943,783

FEED FORWARD DISTORTION CORRECTION CIRCUIT

Toshio Nojima, Yokosuka, Japan, assignor to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jul. 31, 1989, Ser. No. 387,256
Int. Cl.[5] H03F *1/32*
U.S. Cl. 330—149 **6 Claims**



1. A feed forward type distortion correction circuit comprising

a distortion detecting loop including:

(a) a first power splitting means for splitting an input signal into two signals, and for delivering said two signals to a signal amplifying path and a first linear signal path, respectively;

(b) a main amplifier means in said signal amplifying path for amplifying one of said two split signals;

(c) a predistortion correction means in said signal amplifying path at the input side of said main amplifier means, for reducing the level of a distortion component which is produced by said main amplifier means;

(d) a first level control means in at least one of said signal amplifying path and said first linear signal path, for controlling the level of the signal passing therethrough so that the levels of said two signals are substantially equal in absolute value to each other when they are output from said signal amplifying path and said first linear signal path, respectively;

(e) first phase inverting means in at least one of said signal amplifying path and said first linear signal path, for shifting the phase of the signal passing therethrough so that said two signals are opposite in phase when they are output from said signal amplifying path and said first linear signal path; and

(f) a power splitting/combining means formed by a directional coupler which has first and second ports connected to the outputs of said signal amplifying path and said first linear signal path, respectively, said power splitting/combining means also having third and fourth ports and being operative to combine a signal split from the output of said signal amplifying path and a signal split from the output of said first linear signal path to remove the fundamental wave component of said input signal to detect a distortion component in the output of said main amplifying means and to deliver the detected distortion to said fourth port and to deliver the output of said signal amplifying path to said third port without substantial loss; and

said feed forward type distortion correction circuit further having a distortion removing loop including:

(g) a distortion injection path connected to said fourth port of said power splitting/combining means;

(h) a second linear signal path connected to said third port of said power splitting/combining means;

(i) an auxiliary amplifier means in said distortion injection path, for amplifying said detected distortion component;

(j) a second phase inverting means in at least one of said distortion injection path and said second linear signal path, for shifting the phase of one of said amplified distortion component and the distortion component in the signal passing through said second linear path so that the two distortion components are opposite in phase when they are output from said distortion injection path and said second linear signal path, respectively;

(k) second level control means in at least one of said distortion injection path and said second linear signal path, for controlling the level of the signal passing therethrough so that the levels of said two distortion components are substantially equal in absolute value to each other when they are output from said distortion injection path and said second linear signal path, respectively; and

(l) power combining means connected to the outputs of said distortion injection path and said second linear signal path, for combining the signals output from said distortion injection path and said second linear signal path thereby to reduce distortion in the signal output from said power combining means;

said predistortion correction means including:

(m) a second power splitting means for splitting a signal delivered from said first power splitting means into two signals and for delivering them to a third linear signal path and a distortion generating path, respectively;

(n) a distortion generating means provided in said distortion generating path, for generating a distortion component corresponding to said signal delivered from said second power splitting means;

(o) a second power combining means for combining said outputs of said third linear signal path and said distortion generating path and supplying said combined output to said main amplifier means;

(p) a third level control means provided in at least one of said third linear signal path and said distortion generating path; and

(q) a phase shifting means for controlling the phase of the signal passing therethrough so that said distortion component produced by said main amplifier means and said distortion component generated by said distortion generating means are opposite in phase in said second power combining means.

4,943,784

FREQUENCY STABLE DIGITALLY CONTROLLED DRIVER CIRCUIT

Mathew A. Rybicki, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 6, 1989, Ser. No. 319,002

Int. Cl.[5] H03F *3/26, 3/16*

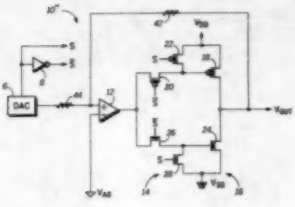
U.S. Cl. 330—264 **10 Claims**

1. A digitally controlled driver circuit comprising:

an output stage having first and second transistors coupled in series between first and second power supply voltage terminals and providing an output signal;

control means coupled to the output stage, said control means making the first and second transistor alternately conductive in response to at least one control signal coupled to the control means; and

means coupled to the output stage and the control means for providing a negative feedback path from the output signal to an input of the control means for use in alternately



making the first and second transistors conductive and for controlling a gain of the driver circuit.

4,943,785

CONTROLLABLE AC VOLTAGE AMPLIFIER

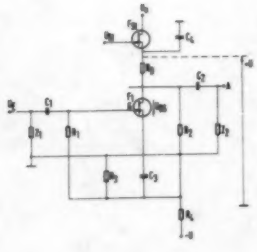
Paul Benz, Stuttgart, and Günther Lippold, Ostfildern, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Apr. 19, 1989, Ser. No. 340,336

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1988, 3814041

Int. Cl.[5] H03G *3/30*; H03F *3/14*

U.S. Cl. 330—277 **11 Claims**



1. A broadband amplifier for amplifying AC voltage, comprising:

a single-gate field-effect transistor, connected in a common source configuration, having a gate terminal, a source terminal and a drain terminal, the input voltage to be amplified being applied to the gate terminal and the source terminal of the single-gate field-effect transistor being directly connected to ground;

first means including a resistance-capacitance combination for connecting a first voltage source to the gate terminal of the single-gate field-effect transistor; and

second means for connecting a variable second voltage source, opposite in sign to the first voltage, to the drain terminal of the single-gate field-effect transistor; wherein the gain of the single-gate field-effect transistor is controllable through the variable second voltage.

4,943,786

DIGITAL CONTROL OF PHASE LOCKED LOOPS

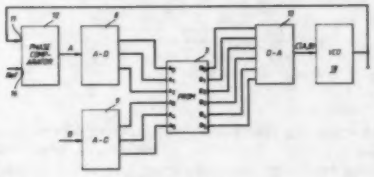
Brian Cordwell, and Paul M. Hayes, both of Dorset, Great Britain, assignors to Plessey Overseas Limited, Essex, England

Continuation-in-part of Ser. No. 87,071, Oct. 23, 1987, abandoned, which is a division of Ser. No. 807,629, Dec. 11, 1985, Pat. No. 4,692,713. This application Sep. 1, 1988, Ser. No. 240,425

Claims priority, application United Kingdom, Dec. 21, 1984, 8432552

Int. Cl.[5] H03L *7/08;* **H03M** *1/70*

U.S. Cl. 331—1 A **7 Claims**



1. A phase locked loop circuit, the circuit including a phase comparator having first and second inputs and an output, a voltage controlled oscillator, having an input and output, and a control circuit having input means and output means, the first input of the phase comparator being coupled to a reference source, the second input of the phase comparator being coupled to the output of the voltage controlled oscillator, the output of the phase comparator being coupled to said input means of the control circuit, and the output means of the control circuit being coupled to the input of the voltage controlled oscillator;

the control circuit comprising a signal translating device, the device having n binary signals inputs and a predetermined number of binary signal outputs;

the signal inputs comprising first and second address groups, first and second signal means for applying first (A) and second (B) binary signals to the inputs of the respective first and second address groups;

the signal translating device providing a signal translating function such that said binary signal output are provided which are a predetermined function (C) of the first and second signals (A, B).

4,943,787

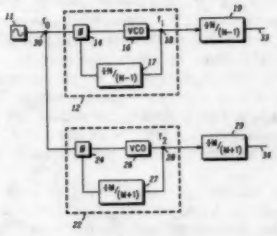
DIGITAL TIME BASE GENERATOR WITH ADJUSTABLE DELAY BETWEEN TWO OUTPUTS

Mavin C. Swapp, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 5, 1989, Ser. No. 403,271

Int. Cl.[5] H03K *5/15;* **H03L** *7/07*

U.S. Cl. 331—2 **15 Claims**



7. A method for producing two reference signals of the same frequency which are out of phase by a fixed time separation Δt comprising the steps of: providing a frequency f_0; multiplying f_0 by a first integer N to produce a frequency f_1; multiplying f_0 by a second integer M to produce a frequency f_2; dividing f_1 by N to produce the first reference signal; dividing f_2 by M to produce the second reference signal; dividing f_1 by an integer other than N for at least one cycle of the first reference signal and/or dividing f_2 by an integer other than M for at least one cycle, thereby shifting the first reference signal with respect to the second reference signal by Δt.

4,943,788

BROAD BAND VCO CONTROL SYSTEM FOR CLOCK RECOVERY

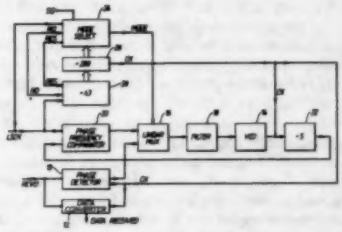
Peter G. Laws, and Graham J. Fletcher, both of Wiltshire, United Kingdom, assignors to Plessey Overseas Limited, Ilford, United Kingdom

Filed Mar. 28, 1989, Ser. No. 329,719

Claims priority, application United Kingdom, Mar. 28, 1988, 8807320

Int. Cl.[5] H03L *7/087, 7/095*

U.S. Cl. 331—11 **10 Claims**



4. In a data receiver circuit for receiving a data signal which includes transitions between upper and lower voltage levels, a clock circuit for providing a clock signal locked in phase to the data signal, the clock circuit comprising:

a phase locked loop having a voltage controlled oscillator providing said clock signal;

a first phase detection means responsive to said clock signal and to the incoming data signal for providing a first phase error signal;

a reference clock source providing a reference clock signal, a second phase detection means for comparing the reference clock signal with said clock signal for providing a second phase error signal;

selection means for selecting either the first or second phase error signal for control of the voltage controlled oscillator;

and a digital counting system for control of the selection means, the digital counting system comprising a reference period means responsive to the reference clock signal for defining a reference period;

a counting means for counting the number of pulses of said clock signal occurring during said reference period,

the counting means including output means for providing output signals in dependence on whether said number of pulses fall within predetermined limits;

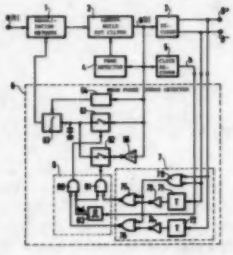
said selection means being coupled to receive the output signals of said counting means for controlling the operation of the selection means for permitting control of the voltage controlled oscillator by the first phase error signal or the second phase error signal.

4,943,789

AUTOMATIC EQUALIZER FOR DIGITAL TRANSMISSION

Serge Surie, L'Hay les Roses, France, assignor to Societe Anonyme dite Alcatel CIT, Paris, France

Filed Mar. 30, 1988, Ser. No. 175,421
Claims priority, application France, Mar. 31, 1987, 87 04477
Int. Cl.[5] H04B 3/14
U.S. Cl. 333—18 7 Claims



1. An automatic equalizer for synchronous digital transmission, said equalizer having an input for receiving a digital transmission signal occupying a frequency range including a Baud frequency and a half Baud frequency and having an output for providing an equalized digital transmission signal having a peak amplitude, said equalized digital transmission signal characterized by a succession of Baud intervals some of which are occupied by pulses and others of which are empty of pulses, with at least some of the Baud intervals which are empty of pulses being occupied by pulse skirts having zero crossings nominally appearing at middles of said Baud intervals occupied by pulse skirts, said equalizer comprising:

a variable equalization network having a network input coupled to said equalizer input for receiving said digital transmission signal and a network output coupled to said equalizer output for providing said equalized digital transmission signal, said network characterized by a gain transfer characteristic with a slope over a given frequency range and being responsive to a control signal for modifying said slope of said gain transfer characteristic in said frequency range occupied by said received digital transmission signal without modifying the value of the gain at said half Baud frequency of said digital transmission signal, said variable equalization network comprising a half-T filter cell having a cell input coupled to said network input and a cell output coupled to said network output and having a first branch in series between said cell input and output and a second branch connected between said cell output and a reference level, said first branch including a variable resistance and said second branch including an oscillator circuit comprising a parallel-connected inductance and capacitance, said oscillator circuit being tuned to a frequency lying between said Baud frequency and said half Baud frequency;

mean phase error detection means having an input responsive to said equalized digital transmission signal for detecting a mean phase error in said zero crossings in the equalized digital signal relative to the middles of said Baud intervals in the equalized digital transmission signal, said detection means having an output coupled to said variable equalization network for providing said control signal to said variable equalization network to increase said slope of said gain transfer characteristic when said detection means detects a phase delay and to reduce said slope when said detection means detects a phase advance; and

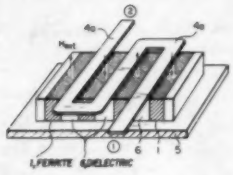
an automatic gain control circuit responsive to said digital transmission signal for maintaining said peak amplitude at a substantially constant value.

4,943,790

RESONANCE ABSORPTION-TYPE MICROSTRIP LINE ISOLATOR

Shigeru Takeda, Kumagaya, and Takashi Tsuboi, Tottori, both of Japan, assignors to Hitachi Metals, Ltd, Japan

Filed Jan. 19, 1989, Ser. No. 299,182
Claims priority, application Japan, Jan. 20, 1988, 63-9940
Int. Cl.[5] H01P 1/365
U.S. Cl. 333—24.2 10 Claims



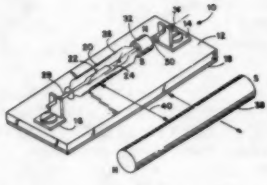
1. A resonance absorption-type microstrip line isolator comprising a ground conductor; a microwave ferrite member provided on said ground conductor; a central conductor provided on said microwave ferrite member; and a pair of permanent magnets disposed on both sides of said central conductor with the opposite magnetic poles of said permanent magnets facing said microwave ferrite member, wherein portions of said microwave ferrite member on both sides of said central conductor are vertically magnetized in opposite directions, so that a microwave propagating in one direction is absorbed by resonance and a microwave propagating in an opposite direction is not absorbed.

4,943,791

WIDE GAP MAGNETIC REED SWITCH AND METHOD FOR MANUFACTURE OF SAME

Thomas J. Holce, and Keith E. Flint, both of Portland, Oreg., assignors to Sentrol, Inc., Portland, Oreg.

Filed Jan. 25, 1989, Ser. No. 301,803
Int. Cl.[5] H01H 1/66
U.S. Cl. 335—153 8 Claims



1. A switch device for controlling an electrical circuit in response to the presence of a magnetic field of predetermined strength, said switch device comprising:

(a) a reed switch having a pair of contacts including at least one magnetic reed contained within an elongate capsule having a reed axis, said contacts being movable relative to one another from an unactuated state to a magnetically actuated state in response to the presence of a magnetic field of at least a predetermined minimum flux density;

(b) a magnetic lead extending outwardly from said capsule and connected electrically with one of said contacts and having a portion thereof aligned coaxially with said reed axis;

(c) permanent magnet means having an axis of polarity and associated with said magnetic lead, for providing a predetermined portion of said predetermined minimum flux density, said predetermined portion being less than a latching flux density required to retain said contacts in said magnetically actuated state;

(d) said permanent magnet means being located adjacent said magnetic lead so as to provide said predetermined portion of said predetermined magnetic field strength such that said axis of polarity is substantially parallel to said reed axis and said permanent magnet means is located adjacent an end of said elongate capsule; and

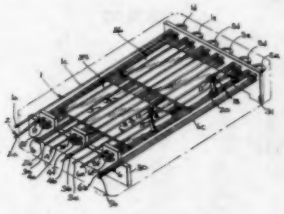
(e) a portion of said magnetic lead extending beyond said permanent magnet means and thence being doubled back alongside and outside said capsule and extending to a position alongside at least a portion of said magnetic reed.

4,943,792

SUPERCONDUCTING SWITCH PACK

Vishnu C. Srivastava, and John J. Wollan, both of Florence, S.C., assignors to General Electric Company, Milwaukee, Wis.

Filed Feb. 25, 1988, Ser. No. 160,387
Int. Cl.[5] H01F 7/72
U.S. Cl. 335—216 **12 Claims**



1. A superconducting switch pack, comprising:

at least one switch element, said switch element including a length of superconductive wire having a switching portion and two lead portions, said switching portion being between said lead portions;

means for supporting said switching portion in a plane in a common mold;

hardened resin means encapsulating said switching portion in said plane in a solid body;

wherein the solid body has an exterior surface which is planar and substantially parallel with and spaced apart from the plane in which said switching portion is positioned, said exterior surface being exposed to the exterior of the switch pack and the resin means filling the space between the exterior surface and the plane of said switching portion so as to provide uninterrupted thermal communication between the plane of said switching portion and the exterior of the switch pack; and

a heater element in thermal contact with said switching portion, said heater element being disposed along a side of said plane of the switching portion which is opposite from the exterior surface of the solid body.

4,943,793

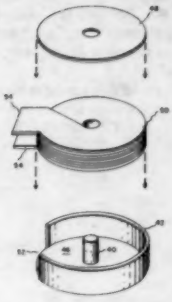
DUAL-PERMEABILITY CORE STRUCTURE FOR USE IN HIGH-FREQUENCY MAGNETIC COMPONENTS

Khai D. T. Ngo, Gainesville, Fla., and Richard J. Charles, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,078
Int. Cl.[5] H01F 27/24
U.S. Cl. 336—83 **30 Claims**

1. A dual-permeability magnetic core for use in high-frequency inductors and transformers, comprising:

a housing of magnetic material having a winding window formed in the interior thereof for containing a plurality of planar conductors, said housing forming a closed-loop magnetic core comprising sections of low-permeability magnetic material and sections of high-permeability magnetic material, said low-permeability sections alternating with said high-permeability sections, said magnetic sections providing walls for substantially completely enclosing the planar conductors, said magnetic sections further being arranged so that said low-permeability sections



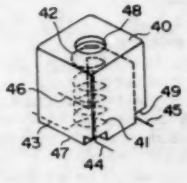
provide a magnetic flux path substantially parallel to said low-permeability sections and said high-permeability sections provide a magnetic flux path substantially perpendicular to said low-permeability sections.

4,943,794

MOLDED COIL AND MANUFACTURING METHOD THEREOF

Masato Suzuki, and Tomio Mizutani, both of Tsurugashima-Machi, Japan, assignors to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1989, Ser. No. 383,089
Claims priority, application Japan, Jul. 27, 1988, 63-187276
Int. Cl.[5] H01F 15/10, 27/30
U.S. Cl. 336—192 **4 Claims**



1. A molded coil comprising:

a coil arranged along at least one vertical direction in which the coil is extending and buried in a synthetic resin body,

an end part of the coil bent in the resin body in a horizontal direction so as to be orthogonal with the vertical direction and exposed to the outside of the resin body, and

the other end part of the coil exposed to the outside of the resin body parallel to the vertical direction and bent outside of the resin body in the horizontal direction, to form a face-to-face connection terminal, respectively.

4,943,795

OXIDE RESISTOR

Takeo Yamazaki; Satoru Ogihara, both of Hitachi; Tetsuo Kosugi, Ibaraki; Shingo Shirakawa, Hitachi, and Shinichi Owada, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

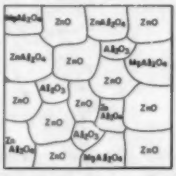
Continuation of Ser. No. 748,166, Jun. 24, 1985, Pat. No. 4,736,183. This application Mar. 14, 1988, Ser. No. 168,136

Claims priority, application Japan, Jun. 22, 1984, 59-127474; May 10, 1985, 60-97805

The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.

Int. Cl.[5] H01C *7/10*

U.S. Cl. 338—21 **34 Claims**



1. A composite sintered oxide resistor which is obtained by sintering a powdery oxide mixture containing zinc oxide, magnesium oxide, aluminum oxide, and silicon oxide, free of bismuth oxide, and having crystal grains of zinc oxide.

4,943,796

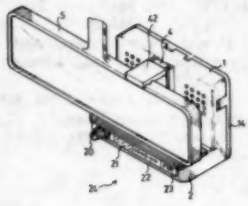
REAR VIEW MIRROR MOUNTED REVERSING DISTANCE SENSOR

Y. C. Lee, 8F-1, No. 23, Sec. 1, Hang Chou S. Rd., Taipei, Taiwan

Filed Jun. 9, 1989, Ser. No. 363,724

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 340—435 **3 Claims**



1. A structure of a rear view mirror mounted reversing distance sensor for automobiles comprising a housing, a cover, a spring and a retaining bracket;

said housing and said cover together forming a hollow, substantially L-shaped structure when assembled by a plurality of screws; said housing being composed of an upright part and a base;

a channel being formed on a central portion of a lateral surface of said upright part, opposite and parallel to said cover; said channel receiving said retaining bracket at an uppermost portion thereof, and a first pad;

a second pad being disposed over an entire top surface of said base; and

said retaining bracket being a flat sheet of metal bent to form an L-shape; a first leg of said retaining bracket being parallel to said cover and having a tab formed thereon with a first hole therethrough for securing of an end of a spring; a second hole provided on a lowermost portion of said channel to receive another end of said spring; said tab extending outwardly and perpendicularly from said lateral surface of said first leg when said retaining bracket is received in said channel; a second leg of said retaining bracket being perpendicular to said cover and having a third pad disposed thereon; a lower surface of said third pad being formed a set of serrations for gripping a rear view mirror when said reversing distance sensor is mounted on said rear view mirror.

4,943,797

DEVICE FOR TEMPORARILY BLOCKING THE RE-MEASUREMENT OF AN ELECTRIC OIL LEVEL MEASUREMENT OF A MACHINE, PARTICULARLY AN INTERNAL COMBUSTION ENGINE

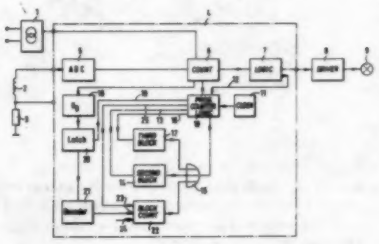
Ulrich Steffenhagen, Liederbach, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 139,611, Dec. 30, 1987, abandoned, which is a division of Ser. No. 762,939, Aug. 6, 1985, Pat. No. 4,739,301. This application Sep. 5, 1989, Ser. No. 403,000

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1984, 3428908

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 340—450.3 **6 Claims**



1. In a device for temporarily blocking re-measurement of an electric oil measurement of a machine, having a measurement probe which is heated by a constant current during a connect time which is commenced by a switch for placing the machine in operation, means for comparing an initial voltage on the measurement probe at a start of the connect time with a later measurement voltage at the end of the connect time of a measurement period, a signaling logic controllable as a function of the result of the comparison in order to signal the oil level, and a blocking-time transmitter which, in combination with a control logic, blocks repeated measurement for at least a predetermined period of time after the machine is turned off or again turned on, the improvement wherein said device further comprises

electric circuit means interconnecting said probe with said blocking-time transmitter, said circuit means being driven by said control logic to transmit said initial voltage from said probe to said blocking-time transmitter, said initial voltage being a measure of temperature of the oil, there being a single probe providing both said initial voltage and said later measurement voltage; and wherein

said blocking-time transmitter produces a variable blocking time as a function of said initial voltage such that the blocking time decreases with an increase in temperature of the oil;

said comparing means includes a counter, there being an analog-to-digital converter interconnecting said counter and said probe for converting analog voltage of said probe to a digital number for said counter, both said initial voltage and said later measurement voltage being converted to digital numbers for said counter; and

said counter and said signaling logic is responsive to both said initial voltage at the start of said connect time and said later measurement voltage at the end of said connect time,

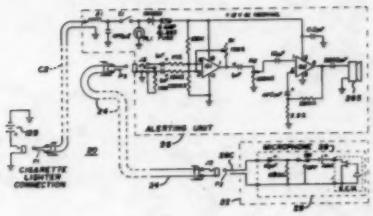
under control of the combination of said control logic and said blocking-time transmitter, to output an oil-level measurement.

4,943,798

LARGE TRUCK REMOTE WHEEL TROUBLE WARNING SYSTEM

Wayman Wayne, 1890 Union St., Lake Station, Ind. 46405

Filed Aug. 26, 1989, Ser. No. 398,776
Int. Cl.[5] B60C *23/00*
U.S. Cl. 340—443 **4 Claims**



1. In a tractor semitrailer rig having a closed cab from which a driver may operate the rig and at least one trailer, which trailer has an underside and wheels monunted at the underside of that trailer, at least some of which wheels are mounted remote from the cab and on opposite sides of the trailer, the improvement comprising:

only one conventional sound sensitive microphone for picking up airborne sound waves in the range of human hearing;

mounting means for said microphone for mounting it to the underside of the trailer at only one location and in such a manner so as to allow said microphone to be able to pick up sound carried by the air from the remote wheels of the trailer from either opposite side of the trailer and from other equipment mounted to the trailer in the vicinity of the remote wheels, said mounting means including means for substantially damping out mechanical vibrations received from said trailer;

communication means connected to said microphone and secured to said trailer, said communication means serving to connect signals developed by said microphone to said cab; and

means mounted inside the enclosed cab for receiving signals from said communication means, and responsive to those signals received from said communication means for alerting the driver to unusual airborne sounds picked up by said microphone, and wherein said alerting means mounted inside the enclosed cab includes a conventional speaker for substantially reproducing the airborne sound waves within the range of human hearing which are picked up by said microphone mounted to the underside of the trailer.

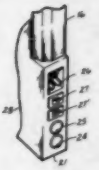
4,943,799

PORTABLE ALARM SYSTEM WITH SEALED ENCLOSURE

Robert Papineau, 8467 Place Choquette, St-Leonard P.Q., Canada

Filed Mar. 3, 1989, Ser. No. 319,176
Int. Cl.[5] G08B *19/00*; H04M *11/00*
U.S. Cl. 340—521 **10 Claims**

1. A portable alarm system comprising a compact portable sealed housing, an electronic alarm control circuit secured inside said housing, a power supply transformer in said housing connected between said control circuit and an AC terminal connector secured to said housing, a telephone jack secured to said housing and to a dialer circuit of said control circuit and to a telephone line jack, an auxiliary DC supply in said housing with an automatic switching device connected thereto to supply said control circuit upon detecting a predetermined supply condition, a digital key pad secured to said housing and having a plurality of switches actuable exteriorly of said housing for programming said control circuit which is contained within said sealed housing and unaccessible from the outside of said housing, and for actuating or deactuating said control circuit, a receiver circuit in said housing and connected to said control circuit, one or more wireless infrared detectors for detecting moving objects and removably secured to said housing; said



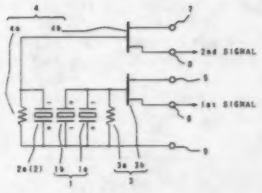
detectors having infrared transmitters, of different frequencies from one another, to transmit to said receiver circuits alarm signals; said receiver having a first channel responsive to a first of said detectors and being connected to said control circuit through a delay circuit means so that said control circuit only switches to an alarm state to generate an alarm code on said telephone line after a predetermined time delay, the others of said detectors being directly connected to said control circuit, and a siren secured to said control circuit to generate an audible local alarm upon actuation of said control circuit to said alarm state.

4,943,800

INTRUSION DETECTION SYSTEM USING THREE PYROELECTRIC SENSORS

Masumi Ikeda, Higashi; Yasuhiro Yamada, Neyagawa; Mahito Tuji, Yahata; Akimasa Tamano, Osaka, and Yasunari Mizoguchi, Sumoto, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 17, 1988, Ser. No. 207,983
Claims priority, application Japan, Jun. 19, 1987, 62-153766; Sep. 16, 1987, 62-231570; Sep. 18, 1987, 62-143448
Int. Cl.[5] G08B *13/18*
U.S. Cl. 340—567 **11 Claims**



1. An intrusion detection system comprising:

an infrared sensor in which three pyroelectric detectors, each having a pair of electrodes, are disposed in line with an interval and an adjoining two of said three pyroelectric detectors are electrically connected to cancel electrical charges generated by each said pyroelectric detector, said sensor outputting a first signal and a second signal on the basis of outputs of said adjoining two and the remaining one of said three pyroelectric detectors, respectively; and

an intrusion detector which detects an infrared ray radiating object based on said first and second signals outputted from said infrared sensor.

4,943,801

GRAPHICS DISPLAY CONTROLLER EQUIPPED WITH BOUNDARY SEARCHING CIRCUIT

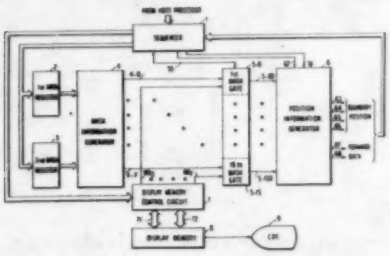
Tetsuji Oguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 161,690

Claims priority, application Japan, Feb. 27, 1987, 62-44840

Int. Cl.[5] G09G 1/00

U.S. Cl. 340—723 **8 Claims**



1. A graphics display controller for searching a boundary of a desired display area stored in a display memory, said boundary of said desired display area being defined by a plurality of bits each having display data of a first logic level and all bits within said desired display area having display data of a second logic level, said controller comprising means for accessing said display memory to produce display data consisting of N bits in parallel, said N being an integer more than one, means for temporarily storing control data, means coupled to said storing means and responsive to said control data for generating mask information consisting of said N bits in which M bits take mask data and the remaining bit or bits take non-mask data, said M being an integer from 0 to N—1, means coupled to said accessing means and said generating means to receive said display data and said mask information for outputting intermediate data consisting of said N bits in parallel, each bit of said intermediate data taking the same data as data of the associated bit of said display data when the associated bit of said mask information takes said non-mask data and taking said second logic level irrespective of data of the associated bit of said display data when the associated bit of said mask information takes said mask data, and means coupled to said outputting means to receive said intermediate data for producing first output information representative of the absence of said boundary when all the bits of said intermediate data take said second logic level and for producing second output information representative of the presence of said boundary when at least one bit of said intermediate data takes said first logic level, said second output information including bit position information relative to a position of a bit that takes said first logic level and is closest to one of the least and most significant bit positions of said intermediate data.

4,943,802

DISPLAY DEVICE

Karel E. Kuijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

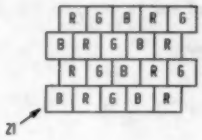
Continuation-in-part of Ser. No. 208,185, Jun. 16, 1988. This application Mar. 3, 1989, Ser. No. 319,004

Claims priority, application Netherlands, Dec. 7, 1988, 8802997

Int. Cl.[5] G09G 3/00

U.S. Cl. 340—784 **5 Claims**

1. A display device comprising an electro-optical display medium between two supporting plates, a system of pixels arranged in rows and columns, with each pixel being formed by picture electrodes arranged on the facing surfaces of the supporting plates, and a system of row and column electrodes for presenting selection and data signals across the pixels for the purpose of picture display, characterized in that the picture electrode on one of the supporting plates is connected in an electrically conducting manner to the common point of two non-linear switching units which are arranged in series between a column electrode for data signals and an auxiliary



electrode for applying, prior to selection, an auxiliary voltage across the pixels beyond or on the limit of the voltage range to be used for picture display in that the column and the auxiliary electrodes are in a straight track and in that the other supporting plate is provided with row electrodes which follow a meandering path.

4,943,803

PAGING SYSTEM WITH PAGING RECEIVERS CONTROLLED DEPENDING ON LOCATION

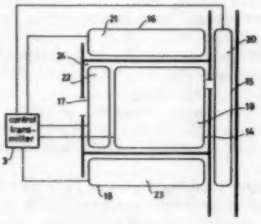
Marcel J. G. Vrijkorte, Emmen, Netherlands, assignor to Ericsson Paging Systems B.V., Emmen, Netherlands

Filed Nov. 30, 1988, Ser. No. 277,879

Claims priority, application Netherlands, Dec. 1, 1987, 8702885

Int. Cl.[5] H04Q 7/00; H04B 7/00

U.S. Cl. 340—825.490 **8 Claims**



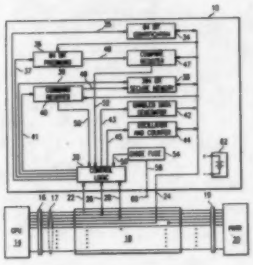
1. A paging system comprising a call transmitter for transmitting a call transmission signal modulated in accordance with a selectable address code, and at least one portable paging receiver with a call receiving part for receiving the call transmission signal and for separating from it the call address code transmitted therewith, a memory for the storage of a call address code allocated to the receiver, a comparator for comparison of the call address codes received and allocated, and a signalling member for generating a signal for a user of the paging receiver depending on the result of the comparison, comprising a control transmission system which has a number of transmission loops encompassing essentially adjacent zones for the transmission of control transmission signals which have the same carrier wave frequencies, and which are angle modulated in accordance with control commands selected for the transmission loops, and in that a paging receiver has a control part for receiving a control transmission signal, for separating from the control transmission signal received the control command transmitted therewith, and for putting and maintaining the paging receiver in a certain state depending on the control command which has been separated from the control transmission signal.

4,943,804

ELECTRONIC KEY LOCKING CIRCUITRY

Robert D. Lee, Denton, and Donald R. Dias, Carrollton, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 163,281, Mar. 2, 1988, Pat. No. 4,870,401. This application Sep. 26, 1989, Ser. No. 412,767
The portion of the term of this patent subsequent to Sep. 26, 2006, has been disclaimed.
Int. Cl.[5] H04Q *1/00*; H01H *47/00*
U.S. Cl. 340—825.310 **5 Claims**



1. An electronic key, comprising:
a fuse;
a counter, connected to count accesses to said electronic key;
control logic, including a latch which can be set by receipt of a predetermined external command;
said control logic being configured so that
at least some commands are accepted before said fuse has been blown but are not accepted after said fuse is blown;
at least some other commands are accepted after said fuse has been blown and before said latch has been set, but are not accepted after said latch has been set; and
at least some other commands are accepted after said latch has been set and before said counter counts off a predetermined number of accesses, but are not accepted after said counter has counted said predetermined number of accesses;
wherein said latch cannot be reset after said fuse has been blown;
and wherein said control logic and said counter are configured so that, if power is restored after said fuse has already been blown, said counter will immediately provide an output indicating that said predetermined number of accesses has already occurred.

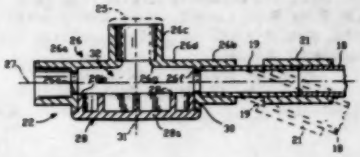
4,943,805

CONDUIT-ENCLOSED INDUCTION LOOP FOR A VEHICLE DETECTOR

James L. Dennison, 213 Tait Ave., Los Gatos, Calif. 95030

Filed Nov. 13, 1986, Ser. No. 930,726
Int. Cl.[5] G08G *1/01*
U.S. Cl. 340—933 **14 Claims**

1. In an inductive loop vehicle detector having a conductor extending in a loop-shaped conduit:
a conductor-surrounding filler within said conduit; and
a conduit coupling assembly joining sections of the conduit comprising:
a body defining (a) a passageway extending through said body sized to receive at each end of said passageway an end of a section of conduit, and (b) an opening externally exposing a portion of said passageway intermediate its ends, said opening being defined by a wall portion extending continuously about said opening; and
a lid sized to completely cover said opening and having a continuous loop-forming extension matingly engaging said continuous wall portion when said lid is covering said opening; and
said continuous extension and wall portion being mutually adherable for sealing said opening;



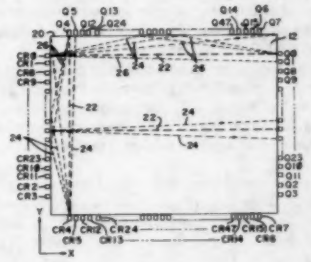
said conductor-surrounding filler filling said coupling assembly; and
an adhesive adhering said continuous extension and said wall portion together.

4,943,806

TOUCH INPUT DEVICE HAVING DIGITAL AMBIENT LIGHT SAMPLING

Timothy E. Masters, Champaign; Paul B. Lucas, Urbana; James E. Garrett, Champaign, and John K. Carstedt, Round Rock, all of Ill., assignors to Carroll Touch Inc., Round Rock, Tex.

Continuation of Ser. No. 621,585, Jun. 18, 1984, abandoned. This application Dec. 6, 1988, Ser. No. 394,261
Int. Cl.[5] H03K *17/78*; G09G *1/00*
U.S. Cl. 341—31 **5 Claims**



1. A touch input device, comprising:
a four-sided frame;
optical emitters disposed in two adjacent sides of said frame and connected to means for intermittently energizing said optical emitters;
optical detectors disposed in the two sides of said frame opposite said emitters;
sampling means for sequentially sampling the light received by said detectors;
converter means for converting the response of the detectors due to the light received by said detectors to a digital value corresponding to the intensity of the light received by the detectors;
processor means connected to said converter means for digitally comparing the output of each said detector during energization of a corresponding emitter with the output of the same detector when the corresponding emitter is not energized, to derive a signal manifesting the interruption or noninterruption of light produced by said emitter and introduced to said detector regardless of ambient light, wherein the processor means includes means for determining if each detector is saturated by digitally comparing the output of each said detector during energization of a corresponding emitter with the output of the

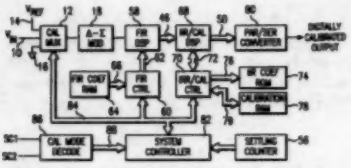
same detector when the corresponding emitter is not energized.

4,943,807

DIGITALLY CALIBRATED DELTA-SIGMA ANALOG-TO-DIGITAL CONVERTER

Adrian B. Early, Buda; Larry L. Harris, and Michael J. Callahan, Jr., both of Austin, all of Tex., assignors to Crystal Semiconductor, Austin, Tex.

Filed Apr. 13, 1988, Ser. No. 180,889
Int. Cl.[5] H03M *1/10*
U.S. Cl. 341—120 **34 Claims**



1. A self-calibrating analog-to-digital converter, comprising:
an oversampled analog modulator for receiving said analog input signal and outputting a digital signal that is proportional to said analog input signal;
a digital filter for filtering out noise on the digital output of said analog modulator;
storage means for a storing digital calibration parameters;
output compensation means for compensating the digital output of said digital filter in accordance with a predetermined compensation algorithm that is a function of said digital calibration parameters; and
calibration means for generating said calibration parameter for storing in said storage means in response to a calibration control signal, said calibration means including:
means for inputting at least one predetermined analog value to the input of said oversampled analog modulator,
means for comparing the digital value output by said digital filter to a predetermined expected value when said one predetermined analog value is input thereto and determining if there is a difference therebetween, and
generating said calibration parameters such that said generated calibration parameters are used in conjunction with said predetermined compensation algorithm will result in a predetermined digital value being output from said output compensation means when an analog input signal equal to said one predetermined analog value is input to said oversampled analog modulator.

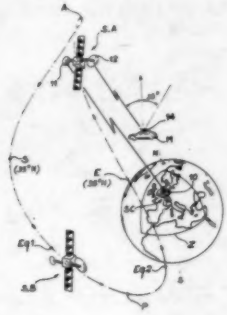
4,943,808

COMMUNICATIONS SYSTEM WITH MOVING BODIES WITH THE AID OF SATELLITES

Jean-Francois Dulck, Ramonville St Agne, and Denis Rouffet, Boulogne, both of France, assignors to Centre National D'Etudes Spatiales, Paris, France

Filed Feb. 14, 1989, Ser. No. 309,888
Claims priority, application France, Mar. 2, 1988, 88 02632
Int. Cl.[5] H04B *7/19, 7/185*
U.S. Cl. 342—356 **6 Claims**

1. A voice communications system for providing continuous communication between a ground communications network and a plurality of moving bodies in a coverage area, said system comprises:
at least one central station located on the ground at a place close to the centre of said coverage area said coverage area having a substantially triangular geographical shape, said station being connected to said ground communications network, said station having an antenna;
at least n geosynchronous satellites, where n is an integer greater than one, said satellites having elliptical orbits with similar ground tracks over said coverage area, said satellites having longitudes of ascending nodes displaced by 2 π/n degrees, each said satellite including transmission-reception means, responsive to start up and shut down commands from said central station, connected to at least one antenna for communication with the central station on the ground for the complete time during which the satellite passes over said ground coverage area; and
each of said moving bodies including a receiver means including a high gain antenna.

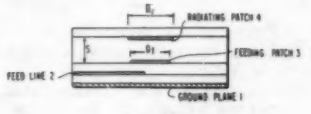


4,943,809

ELECTROMAGNETICALLY COUPLED MICROSTRIP ANTENNAS HAVING FEEDING PATCHES CAPACITIVELY COUPLED TO FEEDLINES

Amir I. Zaghloul, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Continuation of Ser. No. 748,637, Jun. 25, 1985, Pat. No. 4,761,654. This application Apr. 25, 1988, Ser. No. 185,229
Int. Cl.[5] H01Q *00/00*
U.S. Cl. 343—700 MS **23 Claims**



6. A microstrip antenna, comprising:
a plurality of feedlines;
a plurality of feeding patches, each coupled in a contactless manner to at least a respective one of said plurality of feedlines, said feeding patches being impedance matches to respective ones of said feedlines; and
a plurality of radiating patches, each coupled in a contactless manner to a respective one of said plurality of feeding patches, said radiating patches being impedance matches to respective ones of said feeding patches, wherein said feedlines are capacitively coupled to said feeding patches and said feeding patches are capacitively coupled to said radiating patches.

4,943,810

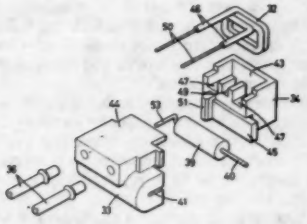
ANTENNA COIL WITH INTEGRAL HOUSING

Katsuo Ito; Eiichi Hibino; Masahiro Nishimura; Kazunori Kinoshita, and Shigeki Takase, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 240,615, Sep. 6, 1988, abandoned. This application May 30, 1989, Ser. No. 358,524

Int. Cl.[5] H01Q 1/24

U.S. Cl. 343—702 **4 Claims**



1. An antenna device for introducing an antenna output to a UHF tuner of a television receiver, comprising:

an insulator body having an open top coil receiving recess therein partly defined by a forwardly facing side wall, said side wall having a top edge having there side by side forwardly extending grooves therein;

an antenna coil formed of a single covered wire and fitted into said recess and having two forwardly extending parallel lead portions extending therefrom, said lead portions being fitted into two of said grooves;

a terminal member having a pair of parallel antenna terminals for receiving said parallel lead portions therein and having a cover integral with said terminal member and extending over the open top of said coil receiving recess when said terminal member is abutted against said insulator body with said lead portions in said antenna terminals, said cover having an elongated projection on the under surface thereof fitted into the remaining one of said grooves, said terminal member further having a rearwardly open resistor containing recess for containing a generally cylindrical shaped resistor and having the length dimension of said resistor containing recess extending transverse to said lead terminals and spaced from and crossing said lead terminals;

said insulator body having a resistor containing recess cover thereon fitting over said laterally open resistor containing recess when said terminal member is abutted against said insulator body.

4,943,811

DUAL POLARIZATION ELECTROMAGNETIC POWER RECEPTION AND CONVERSION SYSTEM

Adrian W. Alden, Masham North; George W. Jull, Nepean, and Tom T. Ohno, Carp, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 23, 1987, Ser. No. 124,159

Int. Cl.[5] H01Q 21/12

U.S. Cl. 343—814 **11 Claims**

1. An antenna aray for receiving a beam of dual polarized electromagnetic waves, comprised of:

(a) a first rectenna formed from a first plurality of dipole antenna elements connected to a first plurality of transmission lines orthogonal to said antenna elements, for receiving and carrying a first polarization component of said electromagnetic waves, said first plurality of transmission lines being characterized by a predetermined inductive reactance,

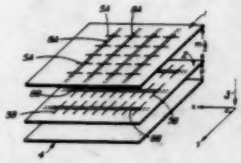
(b) a second rectenna parallel to said first rectenna and formed from a second plurality of dipole antenna elements oriented orthogonally to said first plurality of antenna elements, and connected to a second plurality of transmission lines orthogonal to said second plurality of antenna elements, for receiving and carrying a second polarization component of said electromagnetic waves orthogonal to said first component, said second plurality of transmission lines also being characterized by said predetermined inductive reactance.

(c) a reflector plane parallel to said second rectenna for reflecting incident electromagnetic waves transmitted through said first and second rectennae back to said first and second rectennae for reception thereby,

(d) said first and second rectenna being separated by a first predetermined distance given by $m\lambda/2$, where m is a whole number and λ is the wavelength of said electromagnetic wave,

(e) said second rectenna and reflector plane being separated by a second predetermined distance sufficient for causing the capacitive reactance of free space between said second rectenna and said reflector plane to be equal and opposite to said predetermined inductive reactance of said first and second pluralities of transmission lines, and

(f) said first and second pluralities of dipole antenna elements and transmission lines conforming to a predetermined



alignment with respect to each other wherein respective first lines disposed mid-point between respective rows of said transmission lines of the first rectenna are colinear when viewed along said beam with respective dipole antenna elements on said second rectenna, and further lines disposed orthogonal to said first lines and passing midway between successive ones of said dipole antennae of the first rectenna, and further lines disposed orthogonal to said first lines and passing midway between successive ones of said dipole antenna of the first rectenna are parallel to and midway between respective rows of transmission lines of said second rectenna when viewed along said beam, whereby said first and further lines intersect to form a plurality of independent transmission line cells enclosing respective pairs of said dipole antennae of said first rectenna, such that the effect of said predetermined inductive reactance due to said second and first pluralities of transmission lines is compensated for, and the directivity of said array is characterized by the directivity of each of said cells, thereby resulting in high efficiency reception of said beam of dual polarized electromagnetic waves over a wide range of angles of incidence of said beam on said array.

4,943,812

THERMAL TRANSFER TYPE COLOR RECORDING METHOD AND APPARATUS THEREFOR

Takayuki Yokoyama, and Yasuhiro Kyoden, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 4, 1988, Ser. No. 267,536

Claims priority, application Japan, Nov. 7, 1987, 62-280308; Nov. 7, 1987, 62-280309

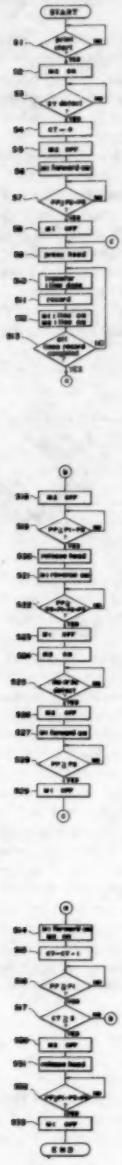
Int. Cl.[5] G01D 9/00, 15/10, 15/04

U.S. Cl. 346—1.1 **12 Claims**

1. A thermal transfer color recording method of recording a color image on a transfer paper by successively transferring

inks of different colors from an ink film to the transfer paper at a recording station, the method comprising:

a first step of transferring an ink of one color from the ink film to the transfer paper based on an image to be recorded, while transporting the ink film and the transfer paper through the recording station in a forward direction in intimate contact with each other and taking up the ink film past the recording station;



a second step of transporting the transfer paper in intimate contact with the ink film in the forward direction with the ink film not taken up to thereby slacken the ink film;

a third step of transporting the transfer paper in the reverse direction to position the leading end of a recorded area of the transfer paper at the recording station;

a fourth step of transporting the ink film in the forward direction to position an ink of another color at the recording station; and

a fifth step of transferring an ink of another color from the ink film to the transfer paper from the leading end of the recorded area thereof based on the image to be recorded, while transporting the ink film and the transfer paper through the recording station in the forward direction in intimate contact with each other and taking up the ink film past the recording station.

4. A thermal transfer color recording apparatus for recording a color image on a transfer paper by successively transferring inks of different colors from an ink film to the transfer paper at a recording station, the apparatus comprising:

ink film supply means for supplying the ink film past the recording station;

ink film take-up means for taking up the ink film supplied by said supply means;

a platen located at the recording station;

a thermal head located adjacent said platen;

paper transport means for transporting the transfer paper in forward and reverse directions through the recording station between said thermal head and said platen; and

control means for controlling said ink film take-up means and paper transport means, after completion of recording with an ink of one color, so as to move the transfer paper in intimate contact with the ink film in the forward direction with the ink film take-up means turned off to thereby slacken the ink film, and thereafter to move the transfer paper in the reverse direction to position the leading end of a recorded area of the transfer paper at the recording station.

4,943,813

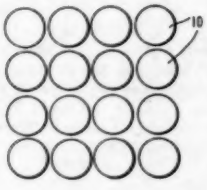
METHOD OF GENERATING OVERHEAD TRANSPARENCY PROJECTING USING AN INK-JET DEVICE

Donald J. Palmer, San Diego, and Peter C. Morris, El Cajon, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 244,545, Sep. 13, 1988, abandoned, which is a continuation of Ser. No. 57,132, Jun. 1, 1987, abandoned. This application Sep. 25, 1989, Ser. No. 412,581

Int. Cl.[5] **B41J** *2/01*

U.S. Cl. 346—1.1 **14 Claims**



1. A method of printing at least two dots of ink sequentially at a particular location to form a spot on an ink-receptive transparent medium by an ink-jet printer comprising printing a first dot of ink at said location during a first scan of a line, delaying by a time sufficiently long to allow the first dot of ink to absorb into said ink-receptive medium, and printing a second dot of ink at said location over said first dot of ink during a second scan of said line, said dot separated from an adjacent dot by a dot-to-dot spacing as measured by the number of dots per unit length, wherein an amount of ink which is required to

generate a printed spot of diameter ϕ meets the condition $\phi \leqq 1/D$, where D is the number of dots per unit length.

4,943,814

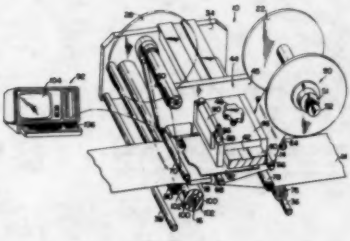
COMPUTER CONTROLLABLE MULTI-PURPOSE PLATEN THERMAL PRINTER

Neal M. Otto, Woodstock, Conn., assignor to Columbia Research and Manufacturing Company, Danielson, Conn.

Filed Mar. 23, 1989, Ser. No. 327,560

Int. Cl.[5] G01D *15/10*; B41J *11/02*

U.S. Cl. 346—1.1 **16 Claims**



1. A printing apparatus for printing on a web of material comprising:

means defining a feed path along which the web of material is advanced in a printing operation, the material having one side and an opposite side;

a printhead mounted at a printing station along the feed path adjacent said one side of the web of material for generating printed information on a surface of the web as the web of material passes along the feed path past the printhead;

a roller platen mounted along the feed path at the printing station and adjacent said opposite side of the web of material and having an axis of rotation extending transversely of the feed path and parallel to said opposite side of the material, the roller platen having at least one outer arcuate surface spaced from the axis of rotation by a given amount selected to press said one side of the web of material under pressure against the printhead during a printing operation, the roller platen also having another outer surface located closer to the axis of rotation than the arcuate surface to provide a gap between the roller platen and the printhead for free movement of the web of material along the feed path when the platen is rotated to position said other surface adjacent the material; and

drive means connected in driving relationship with the roller platen for rotating the platen about the axis and serving as the controlling driver for advancing the web of material past the printhead when the arcuate surface presses the material under pressure against the head during a printing operation.

4,943,815

LASER PRINTER WITH LIGHT-EXPOSURE PREVENTION

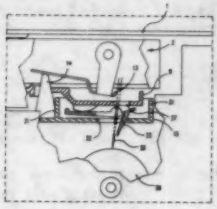
Charles S. Aldrich; James A. Craft; James P. Harden; Steven R. Komplin; William S. Rousey; Praful M. Shah; Earl D. Ward II; Bernard L. Wilzbach, all of Lexington, and Terry L. King, Versailles, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

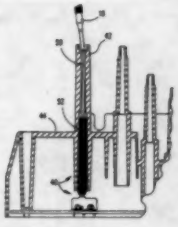
Filed Jun. 29, 1989, Ser. No. 373,767

Int. Cl.[5] G01D *15/14*; G02B *26/02*

U.S. Cl. 346—108 **8 Claims**

1. A printer comprising a source of high-energy light, cartridge receiving means to receive a replaceable cartridge containing a drum responsive to said light to form a transferable image, means to transfer said image to a paper or other thin substrate, and means to deliver said paper or other substrate for removal from said printer, said printer preventing human exposure to said light during normal use and maintenance by said light source being enclosed in a housing substantially opaque to said light having a normally-closed shutter in optical communication with said drum and having a control member positioned to be pushed to the shutter-open position when said cartridge is in place, said housing carrying a switch element





and being mounted on a pivotable top frame of said printer which is pivoted away from said cartridge receiving means for access during maintenance, a switch normally deactivating power to said light source, said switch element being moveable and being moveable to a position activating said switch by said cartridge to activate said power when said cartridge is in said cartridge receiving means and said top frame is pivoted to the position for normal use of said printer.

4,943,816

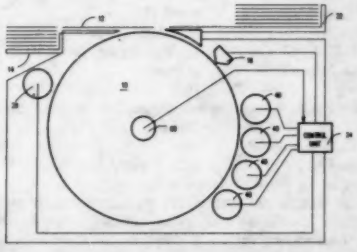
HIGH QUALITY THERMAL JET PRINTER CONFIGURATION SUITABLE FOR PRODUCING COLOR IMAGES

Alfred H. Sporer, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 14, 1989, Ser. No. 366,109

Int. Cl.[5] B41J *2/05, 27/14*

U.S. Cl. 346—25 **18 Claims**



1. A printer suitable for producing color images comprising:

an ink jet printhead for selectively producing drops of a dyeless marking fluid consisting essentially of a mixture of water and a glycol ether;

an image receiving substrate;

means for controlling said ink jet printhead to selectively eject said dyeless marking fluid to produce a fluid image of a desired pattern upon said substrate;

a plurality of roll developing means for developing said fluid image on said substrate while still moist to produce a visible image on said substrate; and

means for fixing said developed image to said substrate to produce a permanent image of the desired pattern on said substrate.

4,943,817

ADAPTOR FOR UNIVERSAL X-Y PLOTTER PEN

Jerald C. Raahauge, San Jose, Calif., assignor to Sumner & Taylor, Inc., San Jose, Calif.

Filed Nov. 14, 1988, Ser. No. 270,837

Int. Cl.[5] G01D *15/16;* **B23B** *5/22;* **B43L** *13/00*

U.S. Cl. 346—140 A **17 Claims**

1. An adaptor for receiving and operationally mounting in the plotter pen head assembly of an X-Y plotter a plotter pen having an elongated tubular body forming a reservoir for marking fluid and having a marking nib on one end thereof communicating with said marking fluid reservoir and a closed end opposite said marking nib, said adaptor comprising:

(a) an elongated tubular sleeve closed at one end and open at the opposite end, and having an inner periphery devoid of threads and configured to snugly receive and frictionally removably retain a plotter pen when inserted within said sleeve; and

(b) means on the exterior surface of said elongated tubular sleeve configured to operationally cooperate with a plotter pen head assembly when said adaptor is mounted thereon whereby said adaptor with a plotter pen inserted therein may be selectively and detachably mounted on said plotter pen head assembly for placement of the marking nib of the plotter pen in a position of use.

4,943,818

INK JET PRINTER

Hideo Hotomi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 7, 1989, Ser. No. 307,747

Claims priority, application Japan, Feb. 9, 1988, 63-28149

Int. Cl.[5] B41J *2/06, 2/175*

U.S. Cl. 346—140 R **34 Claims**

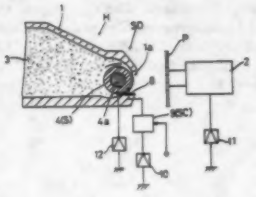
1. An ink jet printer using thermally fusible ink for ejecting the ink in the form of drops, comprising:

an ink nozzle defining a feed passage for feeding the thermally fusible ink and orifice means for ejecting the ink;

ink feed means rotatably disposed adjacent to said orifice means for forcibly feeding the ink to said orifice means;

heating means disposed in said feed passage upstream of the ink feed means for heating and fusing the ink before the ink is fed to the orifice means;

ejecting means downstream of said ink feed means for ejecting the ink fused by said heating means to a recording



medium through said orifice means by electrostatic force, said recording medium set at a distance from said orifice means; and

ejection control means for operating said ejecting means in accordance with an image signal.

4,943,819

IMAGE HOLDING MEMBER AND IMAGE FORMING DEVICE

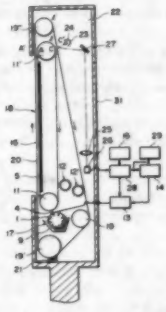
Hitoshi Toma, Kawasaki; Masafumi Hisamura, Toride, and Shigemori Tanaka, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1989, Ser. No. 408,232

Claims priority, application Japan, Sep. 20, 1988, 63-233471; Sep. 20, 1988, 63-233472; Sep. 20, 1988, 63-233474

Int. Cl.[5] G03G *13/22, 5/04*

U.S. Cl. 346—160.1 **14 Claims**



9. An image forming device for adsorbing granular dry process developer onto an image holding member through electrical adsorption force comprising:

an image holding member comprising from a side for holding the dry process developer, a dielectric layer and a diffusion reflection layer having reflective fine particles dispersed in a resin, with said dielectric layer being made to have a ten-point average roughness of 0.1 μm to 5.0 μm;

moving means for moving said image holding member;

recording electrodes arranged in a direction crossing a moving direction of said image holding member;

means for feeding an electroconductive developer disposed between said image holding member and said recording electrodes; and

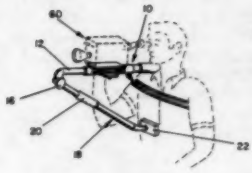
means for applying signal voltages to said recording electrodes.

4,943,820

PORTABLE CAMERA SUPPORT

Warren D. Larock, 4526 Valley Park, S.W., Albuquerque, N. Mex. 87105

Filed Oct. 13, 1989, Ser. No. 420,918
Int. Cl.[5] G03B 29/00
U.S. Cl. 354—82 19 Claims



1. A portable camera support comprising:

a tubular shoulder support member having an open distal end and a proximal end, an extension tube having proximal and distal ends, said proximal end of said extension tube being telescopically slidably engaged in said open distal end of said tubular support member such that said distal end of said extension tube extends from said distal end of said shoulder support member, said proximal end of said shoulder support member being adapted to rest upon a user's shoulder, and said shoulder support member further comprising means for supporting a camera thereon; and

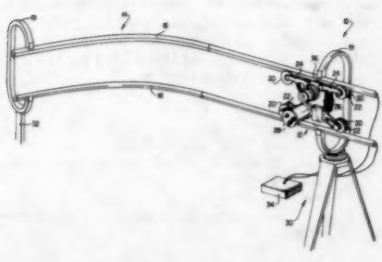
a torso engaging support member having a proximal end and a distal end, said distal end of said torso engaging support member being pivotably connected to said distal end of said extension tube extending from said shoulder support member.

4,943,821

TOPOLOGICAL PANORAMA CAMERA

Janet L. Gelphman, 9337 Lenel Pl., Dallas, Tex. 75220, and Kurt R. Mottweiler, Austin, Tex., assignors to Janet Louise Gelphman, Dallas, Tex.

Filed Jan. 23, 1989, Ser. No. 300,780
Int. Cl.[5] G03B 37/00
U.S. Cl. 354—99 32 Claims



1. Apparatus for recording an image of a subject comprising:

transport apparatus operable to define a predetermined path which is wholly or partially non-rotational; and

a camera connected to said transport apparatus comprising:

a lens for receiving the image;

a recording medium for recording the image; and

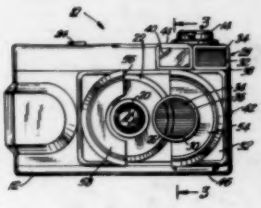
an exposure plate having a slit formed therein for communicating a portion of the image to the recording medium.

4,943,822

CAMERA FOR PHOTOGRAPHING SIMULATED X-RAY IMAGES

Harold von Braunhut, c/o Transcience Corporation, P.O. Box 809, Bryans Road, Md. 20616

Filed Feb. 7, 1989, Ser. No. 307,406
Int. Cl.[5] G03B 13/02, 17/18
U.S. Cl. 354—219 20 Claims



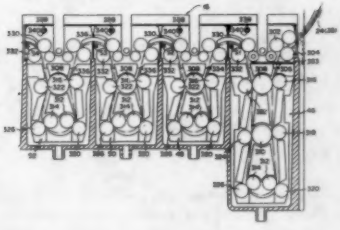
1. A camera comprising an eyepiece and a lens each having the same general field of view, two optical devices each having means for simulating an X-ray image of an object viewed through the device, and means carried by said camera for enabling each one of said optical devices to be simultaneously brought completely out of optical registry with a respective one of said eyepiece and lens to enable a user to view a real image of an object and, if desired, to take a photograph of said real image or into optical registry with a respective one of said eyepiece and lens to enable a user to view a simulated X-ray image of the same object and if desired, to take a photograph of the simulated X-ray image of said object.

4,943,823

STRUCTURE OF WASHING CONVEYANCE ROLLER FOR PHOTOSENSITIVE MATERIAL PROCESSING MACHINE

Kaoru Uchiyama, and Tetuya Ishizuka, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 11, 1988, Ser. No. 230,948
Claims priority, application Japan, Aug. 26, 1987, 62-212292
Int. Cl.[5] G03D 3/02, 3/08
U.S. Cl. 354—322 20 Claims



1. A photosensitive material treatment device for developing an exposed photosensitive material comprising:

(a) treatment chambers each filled with a treatment liquid for treating a photosensitive material;

(b) means for holding and conveying said photosensitive material in said treatment chambers;

(c) means for wiping said treatment liquid remaining on said photosensitive material which has been drawn out from said treatment liquid after said treating in each of said treatment chambers each time said photosensitive material is treated in said treatment chambers; and

(d) means for supplying washing water to said wiping means

after each time said photosensitive material has been drawn out from said treatment chambers, and for washing water to said means, and for subsequently providing said washing water to said treatment chambers after washing said photosensitive material,

whereby said wiping means is maintained clean, said treatment liquid is prevented from being carried to an ensuing process, and a constant level of said treatment liquid in said treatment chambers is maintained.

4,943,824

DEVICE FOR MEASURING OBJECT DISTANCE USED FOR CAMERA

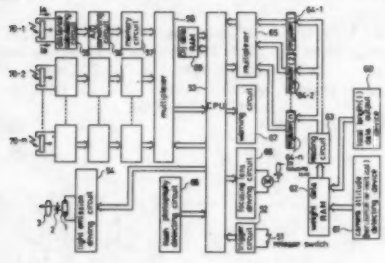
Takayuki Nabeshima; Toru Matsui, and Yukio Maekawa, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 10, 1988, Ser. No. 269,598

Claims priority, application Japan, Nov. 12, 1987, 62-286964; Nov. 12, 1987, 62-286965; Nov. 12, 1987, 62-286966; Nov. 12, 1987, 62-286967; Nov. 12, 1987, 62-286968

Int. Cl.[5] G03B *3/00;* G01C *3/08*

U.S. Cl. 354—400 15 Claims



1. In a device for measuring object distance or in-focus position used for a camera in which object distances or focus adjustment states are measured in a plurality of distance measuring areas in the photographing scene, said device comprising:

calculating means having a plurality of weight data predetermined in correspondence with the position of each distance measuring area in the photographing scene and the object distance, for calculating a weight value by reading the weight data of each distance measuring area in correspondence with the position of an object in the photographing scene and the measured object distance, and

means for judging to be a main object, an object in the distance measuring area of which the weight value calculated by the calculating means is the largest.

4,943,825

PHOTOGRAPHIC CAMERA

Nobuyuki Taniguchi; Yoshiaki Hata, both of Nishinomiya; Yoshinobu Kudo, Sakai; Manabu Inoue, Kobe; Takeo Hoda, Kawachinagano, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

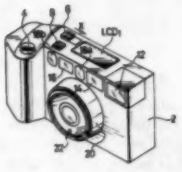
Division of Ser. No. 895,826, Aug. 12, 1986, Pat. No. 4,780,735.

This application Jun. 16, 1988, Ser. No. 207,330

Claims priority, application Japan, Aug. 29, 1985, 60-190520; Aug. 29, 1985, 60-190521; Aug. 29, 1985, 60-190522; Aug. 29, 1985, 60-190523; Aug. 30, 1985, 60-192621; Sep. 10, 1985, 60-201095; Sep. 10, 1985, 60-201096; Nov. 14, 1985, 60-255550; Dec. 19, 1985, 60-286732

Int. Cl.[5] G03B *7/12, 17/24*

U.S. Cl. 354—481 2 Claims



1. A photographic camera having a photographic lens, comprising:

means for selecting a real focal length photographing mode in which a normal range in a frame of a film will be printed on a photographing paper and a pseudo focal length photographing mode in which a range smaller than the normal range in a frame of the film will be printed on a photographing paper;

means for measuring light from a predetermined range corresponding to an angle smaller than an angle of view of the photographic lens, the predetermined range being unchangeable irrespective of the selection of the photographing mode and approximately corresponding to a photographing range in an object field when the pseudo focal length photographing mode is selected; and

means for controlling exposure of the photographic camera in accordance with the measured result.

4,943,826

IMAGE FORMING DEVICE WITH SUPPLEMENTARY EXPOSURE DEVICE

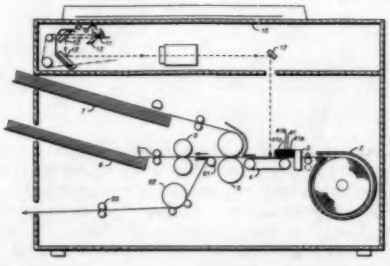
Kunio Ohashi, and Shoichi Nagata, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 3, 1988, Ser. No. 252,678

Claims priority, application Japan, Oct. 23, 1987, 62-268794

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—27 11 Claims



1. In an image forming apparatus having a supplementary

exposure device for supplementarily exposing a light receiving sheet to light in a wavelength range to which said light receiving sheet is sensitive, the improvement wherein said image forming apparatus further comprises

an input means for specifying and outputting a command signal indicative of whether or not said light receiving sheet should be supplementarily exposed to light from said supplementary exposure device and

a driving means for driving or not driving said supplementary exposure device according to said command signal from said input means,

said input means including a detector for detecting the density of a document to be copied and a command transmitting means for transmitting a command to have or not to have said sheet supplementarily exposed to light from said supplementary exposure device, depending on whether of not the density detected by said detector is greater than a predefined reference value.

4,943,827

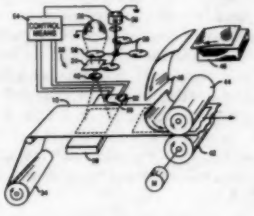
METHOD AND APPARATUS FOR CONTROLLING EXPOSURE OF AN IMAGING SHEET

William G. Good, and Mark E. Holycross, both of Centerville, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Apr. 27, 1989, Ser. No. 344,185

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—30 **29 Claims**



1. An apparatus for producing images from an imaging sheet including a substrate having provided on one of its surfaces a layer of microcapsules containing an image-forming agent and a photohardenable composition, said apparatus comprising:

means for supporting said substrate at an exposure station;

a radiation source operable to provide one or more bands of actinic radiation for exposing said substrate to said one or more bands;

an optical system for focussing said one or more bands of actinic radiation onto said substrate at said exposure station to form a latent image on said substrate;

a developing device for developing the latent image into a visible image onto said substrate or onto a receiver substrate;

environmental sensor means for sensing at least one environmental condition within said exposure station prior to exposure; and

exposure control means responsive to said environmental sensor means for controlling the amount of actinic radiation received by said substrate during said exposure at least partially as a function of said environmental condition.

4,943,828

REPLACEMENT OF A CARTRIDGE USABLE WITH IMAGE FORMING EQUIPMENT

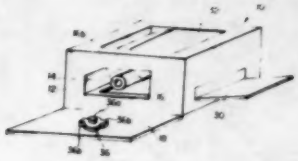
Yoshiharu Manabe, Kawasaki, and Koji Sakamoto, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

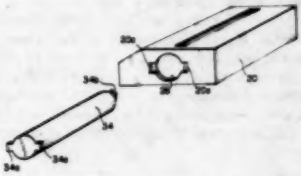
Filed May 31, 1989, Ser. No. 359,644

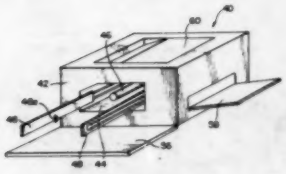
Claims priority, application Japan, May 31, 1988, 63-70990[U]; May 31, 1988, 63-70991[U]

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—200 **7 Claims**







1. An apparatus for replacing a cartridge for use with image forming equipment which has a housing, a cover openably mounted on said housing, and an image carrier rotatably mounted on a shaft and having an end portion which is uncovered when said cover is opened, said apparatus comprising:

a box-like cartridge accommodating at least one of a plurality of image forming process units which are to be positioned around and in a predetermined relative position to the image carrier, said cartridge being selectively coupled over and uncoupled from the image carrier; and

positioning member provided on the cover for, when the cover is closed, engaging with the image carrier and said cartridge to position said image carrier and said cartridge such that the predetermined relative position is maintained.

4,943,829

IMAGE FORMING APPARATUS

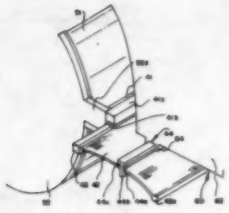
Kenji Sasaki, Takarazuka; Mitsuo Matsushita, Higashiosaka; Kenzo Ono, Osaka; Akihiro Horiwaki; Katsunori Fujii, both of Higashiosaka, and Hiroyuki Hatano, Nishinomiya, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Aug. 29, 1989, Ser. No. 400,206

Claims priority, application Japan, Aug. 31, 1988, 63-114390[U]; Aug. 31, 1988, 63-114391[U]; Oct. 28, 1988, 63-141468[U]

Int. Cl.[5] B60B *21/00*

U.S. Cl. 355—215 11 Claims



1. An image forming apparatus for forming an image by developing a latent image on a photoconductor drum with developer delivered from a developer unit disposed facing the photoconductor drum, comprising a developer collecting member that is integrally molded with a pair of photoconductor drum supporting side plates which rotatably support the photoconductor drum, and that is disposed between the photoconductor drum supporting side plates so as to collect the developer falling from between the photoconductor drum and the developer unit.

4,943,830

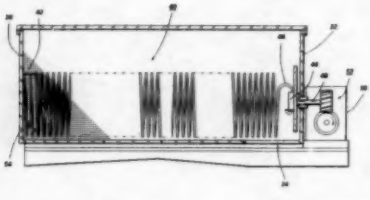
DEVELOPER DISPENSING APPARATUS WITH A SPRING ELEMENT HOLD DOWN SHOE MECHANISM

Timothy J. Sulenski, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 7, 1989, Ser. No. 320,183

Int. Cl.[5] G03G *15/06*

U.S. Cl. 355—245 3 Claims



1. A developer dispensing apparatus including an elongated container enclosed at both ends having a substantially circular cross section capable of containing a given quantity of developer, said container having a dispensing opening adjacent one end and containing an integral developer transport mixing member rotatably supported at the opposite end of said container and unsupported at said one end, said mixing member comprising a coiled spring element adapted to rotate in a direction so as to transport developer along its length toward said dispensing opening, said dispensing apparatus characterized by further including a hold down shoe mechanism fixedly attached to the container end associated with the unsupported end of said spring element, at least a portion of said spring element rotatably encircling said hold down mechanism whereby any vertical movement of the unsupported end of said mixing member during rotation is restrained by the mechanical contact with the adjacent surface of said hold down mechanism.

4,943,831

FIXING DEVICE FOR FIXING A POWDER IMAGE ON A RECEIVING SHEET

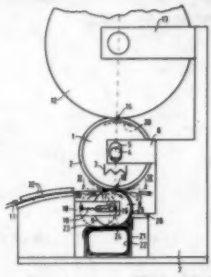
Jacques J. M. Geraets, Velden; Julius V. C. Graswinckel, Arcen, and Martin L. van der Sterren, Roermond, all of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Oct. 26, 1989, Ser. No. 427,827

Claims priority, application Netherlands, Oct. 27, 1988, 8802644

Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—290 8 Claims



1. In fixing device for fixing a powder image on a receiving sheet in which a fixing roller and a pressure roller together form a first zone which defines a fixing nip, and a biasing member which presses against the pressure roller in a second zone of said pressure roller located substantially opposite to said fixing nip for tangentially directing a frictional force on said pressure roller in at least one of said zones on rotation of the rollers, the improvement in combination therewith comprising deflection-limiting means to limit deflection of said pressure roller in the direction of said frictional force and said pressure roller having a flexural stiffness much less than the flexural stiffness of said fixing roller such that at said frictional force said pressure roller deflects in the direction in which the frictional force acts.

4,943,832

IMAGE FORMING APPARATUS

Kiyoshi Emori, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 7, 1989, Ser. No. 362,576

Claims priority, application Japan, Jun. 9, 1988, 63-142084; Jun. 9, 1988, 63-142085

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—313 38 Claims

1. An image forming apparatus, comprising:

an image forming means for forming images on a sheet being transported;

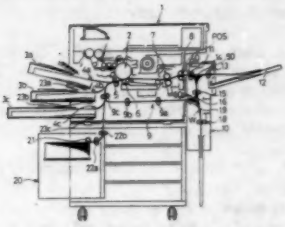
a sheet feeding means for feeding a sheet one by one;

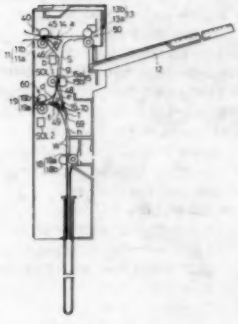
a sheet transporting means for transporting a sheet being fed by the sheet feeding means for image formation, which includes a sheet re-feeding path capable of transporting the sheet to the image forming means against for further image formation by successively receiving the sheet which completed an image forming operation;

a first transport path switching means for selectively guiding a sheet after image formation either to the sheet re-feeding path or to the outside of the apparatus;

a sheet turning over means provided in the sheet re-feeding path for turning over the sheet being refed;

an image forming mode selecting means for selecting either a composite image forming mode in which plural numbers of image forming operations are performed on the same surface of the sheet or a both-surface image forming mode wherein image forming operations are carried out on both surfaces of the sheet;





a second transport path switching means for selectively guiding a sheet being directed to the sheet re-feeding path to pass through the sheet turning over means or not therethrough in accordance with the mode selected; and

a controlling means for controlling the maximum number of sheets present in said sheet transporting means simultaneously in accordance with the mode selected by said image forming selecting means.

4,943,833

COLOR COPYING APPARATUS AND METHOD

Shigenobu Fukushima, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 20, 1989, Ser. No. 369,058

Claims priority, application Japan, Jun. 21, 1988, 63-152632; Jun. 21, 1988, 63-152633

Int. Cl.[5] **G03G** *15/01*

U.S. Cl. 355—326 **7 Claims**

1. A copying apparatus, comprising:

a table for mounting an original;

a photoreceptor;

first latent electrostatic image forming means for forming a first latent electrostatic image on said photoreceptor based on a image of said original;

means for supplying electric signal indicative of additional information;

second latent electrostatic image forming means for forming a second latent electrostatic image on said photoreceptor based on said electric signal;

a plurality of developing means containing toners of different colors for turning said latent electrostatic images formed on said photoreceptor into toner images;

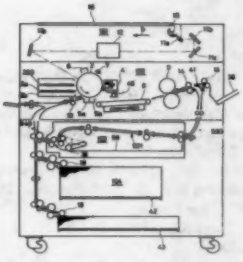
first designating means for designating a color of a toner by which the first latent electrostatic image formed by said first latent electrostatic image forming means is to be developed;

second designating means for designating a color of a toner by which the second latent electrostatic image formed by said second latent electrostatic image forming means is to be developed;

transferring means for transferring the toner images on said photoreceptor onto a sheet of copy paper at a transferring position;

paper re-feeding means for feeding again the sheet of paper on which the toner images have been transferred to said transferring position;

means for determining whether or not said color of the toner designated by said first designating means is the same as said color of the toner designated by the second designating means;



first controlling means controlling the copying apparatus such that said first and second latent electrostatic images are simultaneously formed by said first and second latent electrostatic image forming means on said photoreceptor, developed by the toner of said designated color to be transferred onto said sheet of copy paper, when the colors of the toners designated by said first and second designated means are the same; and

second controlling means for controlling the copying apparatus such that said latent electrostatic image is formed by either one of said first and second latent electrostatic image forming means, developed by the toner of said designated color to be transferred onto said sheet of copy paper, thereafter said sheet of copy paper is again fed to the transferring position by said paper re-feeding means, and the latent electrostatic image is formed by the other one of said latent electrostatic image forming means, developed by the toner of said designated color to be transferred onto said sheet of paper fed again to said transferring position, when the colors of the toners designated by said first and second designating means are different from each other.

4,943,834

IMAGE FORMING APPARATUS CAPABLE OF DETECTING, ANALYZING AND DISPLAYING AN ORIGINALS SPECTROSCOPIC COLOR DATA

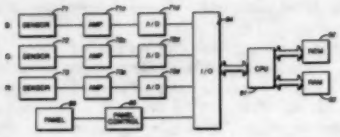
Yasutaka Maeda, Nara; Tsuyoshi Miyamoto, Osaka; Yukihiko Ueno, Osaka, and Hiromi Washio, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 1, 1988, Ser. No. 239,446

Claims priority, application Japan, Sep. 30, 1987, 62-248971; Sep. 30, 1987, 62-248972

Int. Cl.[5] G03G *15/01, 21/00*

U.S. Cl. 355—327 **7 Claims**



1. In a color copier which includes a photoreceptor, separates colors of reflected light from an original and forms a color toner image by toner of complementary colors, the improvement wherein said color copier comprises

optical sensor means for analyzing colors of said reflected light from said original and detecting spectroscopic color data of said reflected light,

a control panel, and

control means for causing said detected spectroscopic color data to be display on said control panel and operating said color copier under conditions inputted through said control panel.

4,943,835

SEMICONDUCTOR DEVICE INCLUDING PROTECTING MOS TRANSISTOR

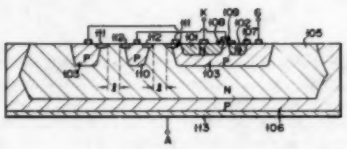
Shigenori Yakushiji, Yokohama, and Kouji Jitsukata, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 927,114, Nov. 5, 1986, abandoned. This application Sep. 29, 1988, Ser. No. 253,364

Claims priority, application Japan, Nov. 22, 1985, 60-261274

Int. Cl.[5] H01L *29/78, 29/74*

U.S. Cl. 357—23.13 **4 Claims**



1. A semiconductor device including a protecting MOS transistor comprising:

a first semiconductor region of a first conductivity type connected to a first voltage supply source;

a second semiconductor region of a second conductivity type which has a main surface and whose surface except for said main surface contacts said first semiconductor region;

a third semiconductor region of the first conductivity type formed in said second semiconductor region and connected to a second voltage supply source, said second semiconductor region having an island region surrounded by said third semiconductor region;

a fourth semiconductor region of the second conductivity type formed in said third semiconductor region and connected to a third voltage supply source;

a fifth semiconductor region of the second conductivity type formed in said third semiconductor region and short-circuited to said third semiconductor region;

a gate insulating layer continuously provided on one surface portion of said fourth semiconductor region, one surface portion of said fifth semiconductor region and the surface portion of the third semiconductor region between said fourth and fifth semiconductor regions;

a gate control electrode provided on said gate insulating layer;

a sixth semiconductor region of the first conductivity type formed in said island region and connected to said gate control electrode to apply a voltage appearing on said sixth semiconductor region thereto, with a surface junction between said sixth semiconductor region and said island region;

a first diffusion region of the first conductivity type having a depth less than that of said third semiconductor region, said first diffusion region being continuously formed in one portion of said island region and in one portion of said third semiconductor region and contacting at least one portion of the surface junction between said third semiconductor region and said island region of said second semiconductor region; and

a second diffusion region of the first conductivity type having a depth less than that of said sixth semiconductor region and facing said first diffusion region, said second diffusion region being continuously formed in one portion of said island region and in one portion of said sixth semiconductor region and contacting at least one portion of the surface junction between said sixth semiconductor region and said island region; and

a distance between said first diffusion region and said second diffusion region sufficient for providing that the voltage applied to the gate control electrode from the sixth semiconductor region is less than a breakdown voltage of the gate insulating layer.

4,943,836

ULTRAVIOLET ERASABLE NONVOLATILE SEMICONDUCTOR DEVICE

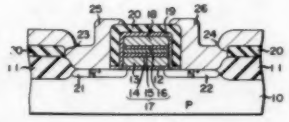
Seiichi Mori, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 25, 1988, Ser. No. 224,026

Claims priority, application Japan, Jul. 30, 1987, 62-190863

Int. Cl.[5] H01L *49/02, 29/78, 29/34*

U.S. Cl. 357—23.5 **3 Claims**



1. An ultraviolet erasable nonvolatile semiconductor device comprising:

a first conductivity-type semiconductor substrate;

source and drain regions formed in a surface of said substrate;

a first gate insulating layer consisting of a single silicon oxide layer formed on a portion of said surface between said source and drain regions;

a floating gate provided on said silicon oxide layer;

a second gate insulating layer formed on said floating gate, said second gate insulating layer consisting of a first silicon oxide layer, a silicon nitride layer formed on said first silicon oxide layer, and a second silicon oxide layer having

a thickness of 30 Å or less formed on said silicon nitride layer; and

a control gate provided on said gate insulating layer.

4,943,837

THIN FILM SEMICONDUCTOR DEVICE AND METHOD OF FABRICATING THE SAME

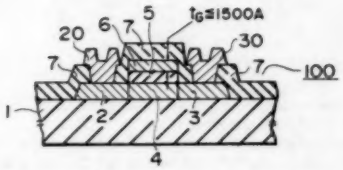
Nobutake Konishi, Hitachiota; Kikuo Ono, Hitachi; Takaya Suzuki, and Kenji Miyata, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1988, Ser. No. 166,518

Claims priority, application Japan, Mar. 11, 1987, 62-54044

Int. Cl.[5] H01L *29/78, 29/167*

U.S. Cl. 357—23.7 **11 Claims**



1. A thin film semiconductor device which includes a silicon layer formed on an insulating substrate and made of one of amorphous silicon and polycrystalline silicon, a gate electrode formed over the silicon layer through an insulating film and made of one of amorphous silicon and polycrystalline silicon, source and drain regions formed in the silicon layer so that the projection of the gate electrode onto the silicon layer is interposed between the source and drain regions, a channel region beneath the gate electrode and the insulating film, and source and drain electrodes kept in ohmic contact with the source and drain regions, respectively, wherein the thickness of the gate electrode is made less than or equal to 1,500 Å, whereby an active element for passivation can penetrate through the gate electrode into a surface layer of the entire channel region, which surface layer has a substantially uniform thickness, so that a passivated surface layer of the channel region, having a substantially uniform thickness for the entire channel region, can be achieved, and wherein the device further includes said passivated surface layer, having said active element for passivation therein so as to provide said passivated surface layer, having the substantially uniform thickness, for the entire channel region.

4,943,838

THIN FILM TRANSISTOR AND METHOD OF MAKING THE SAME

Yasuhiro Ukai, Kobe, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Jan. 4, 1988, Ser. No. 140,688

Claims priority, application Japan, Jan. 16, 1987, 62-7657

Int. Cl.[5] H01L *29/78, 27/12, 49/02*

U.S. Cl. 357—23.7 **7 Claims**

1. A thin film transistor comprising:

a source electrode and a drain electrode disposed in spaced relation to one another on an insulating substrate;

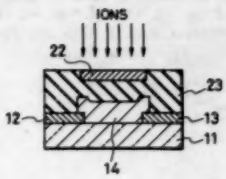
a semiconductor layer on the substrate between the source and drain electrodes;

a gate insulating film in contact with the semiconductor layer;

a gate electrode in contact with the gate insulating film;

the gate insulating film being an insulating organic molecular film;

the gate electrode being formed in a selected region of the gate insulating film and being a conductive layer containing free carbon; and said gate electrode being formed on a



side of said gate insulating film and being separated from the semiconductor layer.

4,943,839

CONTACT TYPE IMAGE SENSOR

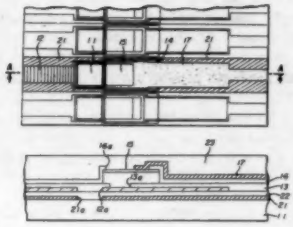
Masafumi Kumano, Sendai, and Kenji Yamamoto, Miyagi, both of Japan, assignors to Ricoh Company, Ltd., Tokyo and Ricoh Research Institute of General Electronics, Natori, both of, Japan

Filed Aug. 18, 1988, Ser. No. 233,364

Claims priority, application Japan, Aug. 19, 1987, 62-205979

Int. Cl.[5] H01L *27/14, 31/00*

U.S. Cl. 357—30 **16 Claims**



1. A contact type image sensor comprising:

a transparent dielectric substrate;

an upper transparent electrode;

a lower electrode provided on said transparent dielectric substrate;

a semiconductor thin film sandwiched between said upper transparent electrode and said lower electrode and constituting a photoelectric conversion part;

a transparent dielectric layer formed on a plane on which said lower electrode is provided; and

an upper electrode formed on said transparent dielectric layer and connected to said upper transparent electrode,

said transparent dielectric layer covering all exposed surfaces of said semiconductor thin film excluding surfaces which make contact with said upper transparent electrode and said lower electrode,

said upper electrode, said transparent dielectric layer and said lower electrode forming a capacitor structure.

4,943,840

REVERSE-CONDUCTING THYRISTOR

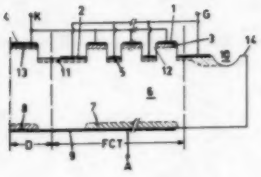
Peter Roggwiller, Riedt-Neerach, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation of Ser. No. 930,454, Nov. 14, 1986, abandoned. This application Mar. 18, 1988, Ser. No. 171,190

Claims priority, application Switzerland, Nov. 29, 1985, 5095/85

Int. Cl.[5] H01L 29/747

U.S. Cl. 357—39 7 Claims



1. A reverse-conducting thyristor having a center, a thyristor section and an antiparallel connected diode section integrated on a common substrate, wherein the thyristor section comprises a field-controlled thyristor (FCT), said reverse-conducting thyristor having opposed cathode and anode sides, said field-controlled thyristor (FCT) comprising a p^+-doped FCT anode layer on the anode side, an n^--doped channel layer lying above the anode layer in a direction towards the cathode side, and, on the cathode side, a plurality of alternately arranged n^+-doped cathode regions and p-doped gate regions, the cathode regions being separated from each other at the cathode side by troughs having side walls and a bottom, said side walls extending from said bottom in the direction towards the cathode side, the gate regions extending across the bottoms of the troughs and defining thereby an interdigitated gate/-cathode structure, the cathode regions having top portions on which are provided FCT cathode contacts and the gate regions having portions on which are provided gate contacts in a gate plane;

said diode section arranged in the center of the reverse-conducting thyristor;

the FCT anode layer restricted to a region of the field-controlled thyristor (FCT) on the anode side outside said center;

an n^+ emitter layer diffused into the diode section at the anode side;

a p^+-doped diode-anode of the diode section layer arranged at the cathode side, wherein the $p^=$-doped anode and the n^--doped channel form a diode pn-junction, said p^+-doped diode-anode layer together with the channel layer extending through the diode section and with said $n^=$ emitter layer forming a diode;

said p^+-doped diode-anode layer electrically connected to the FCT cathode contact via an applied diode-anode contact;

a common anode contact provided at the anode side and extending over the field-controlled thyristor (FCT) and the diode section; and

a gate separation zone including a separating p-doped gate region contacted by a gate contact provided on the cathode side between the field-controlled thyristor (FCT) and the diode section so that the field-controlled thyristor and diode section are decoupled from each other, said gate separation zone having a width at least equal to the thickness of the field-controlled thyristor.

4,943,841

WIRING STRUCTURE FOR SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

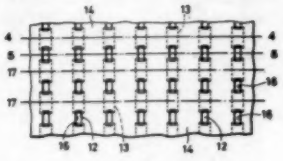
Toshihiko Yahara, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 103,643, Oct. 2, 1987, abandoned. This application Oct. 6, 1988, Ser. No. 256,087

Claims priority, application Japan, Oct. 20, 1986, 63-250104

Int. Cl.[5] H01L 27/10, 27/15, 23/48, 29/54

U.S. Cl. 357—45 7 Claims



1. A semiconductor integrated circuit structure comprising:

a semiconductor substrate (11);

a first insulating layer (12) provided on said substrate;

a first wiring layer (13) disposed on said first insulating layer, said first wiring layer including a plurality of electrically isolated conductive segments each having a first end and a second end;

a second insulating layer (14) disposed on said first wiring layer, said second insulating layer including means for defining plural openings each dimensioned and positioned so as to simultaneously contain a first end of one of said plurality of conductive segments and a second end of a further one of said plurality of conductive segments; and

a second wiring layer (15) formed on said second insulating layer, said second wiring layer including plural planar conductors disposed on said second insulating layer and further including conductive material disposed within selected ones of said openings and not connected to any of said upper wiring layer conductors, said conductive material establishing an electrical connection between ends of different ones of said first wiring layer segments.

4,943,842

SEMICONDUCTOR DEVICE WITH FUSE FUNCTION

Naomasa Sugita, Yokohama; Yoshiharu Yotumoto, Kimitsu; Kouji Moriguchi, Kimitsu, and Toshinobu Sekiba, Kimitsu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 9, 1988, Ser. No. 166,002

Claims priority, application Japan, Mar. 11, 1987, 62-54098

Int. Cl.[5] H01L 27/02, 23/48, 23/26, 23/02

U.S. Cl. 357—51 20 Claims

1. A semiconductor device comprising:

a semiconductor element;

a hollow fuse comprising a fuse material coupled to said semiconductor element;

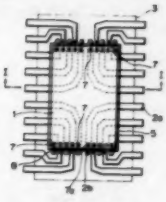
a casing for enclosing said semiconductor element and said hollow fuse; and

insulating means disposed in said casing and in intimate physical contact with said hollow fuse, said hollow fuse defining a hollow portion therein to accommodate molten fuse material when the fuse material is melted.

4,943,843
SEMICONDUCTOR DEVICE

Takayuki Okinaga, Akishima; Hiroshi Tachi, Ohme; Hiroshi Ozaki, Kokubunji; Kanji Otsuka, Higashiyamato; Michiaki Furukawa, Fucyu, and Yasuyuki Yamazaki, Kodaira, all of Japan, assignors to Hitachi Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

Continuation of Ser. No. 240,605, Sep. 6, 1988, abandoned, which is a continuation of Ser. No. 845,332, Mar. 21, 1986, abandoned. This application Dec. 8, 1989, Ser. No. 445,942
Claims priority, application Japan, Mar. 25, 1985, 60-58407
Int. Cl.[5] H01L 23/48, 23/50, 23/12
U.S. Cl. 357—70 38 Claims



1. A semiconductor device comprising:

(a) a plurality of leads, each lead having an inner portion and an outer portion, the inner portions of said leads extending substantially on one plane;

(b) a semiconductor pellet having first and second major surfaces being arranged opposed from each other, at least one electronic device being formed on said first major surface, inner portions of a first group of the plurality of leads extending along said second major surface and arranged so that tips of said inner portions of said first group of leads protrude from a side of the pellet to provide bonding points.

(c) a set of bonding pads disposed on said first major surface along opposite sides of said pellet;

(d) an insulating sheet inserted between and bonded to the inner portions of the first group of leads and the second major surface for providing electrical insulation;

(e) a plurality of bonding wires electrically connected between tips of said inner portions of the plurality of leads and said bonding pads;

(f) a resin sealing body sealing the pellet; the bonding pads, the insulating sheet, the bonding wires and the inner portions of the plurality of leads;

wherein the plurality of leads further includes a second group of leads, said inner portions of the first group of leads being bent to support said pellet thereon, each inner portion of said first group of leads extending from a non-bonding pad-forming side to a bonding pad-forming side of said pellet and inner portions of said second group of leads being disposed along an end of the pellet without supporting the pellet thereon; and

wherein the pellet is supported only by said inner portions of said first group of leads.

4,943,844
HIGH-DENSITY PACKAGE

Alex A. Oscilowski, Charles E. Williams, Gary L. Beene and Peter Zogas, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 22, 1985, Ser. No. 801,029
Int. Cl.[5] H01L 23/04, 23/36, 23/12
U.S. Cl. 357—74 36 Claims

1. A chip carrier comprising:

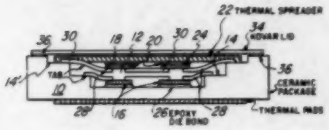
a chip carrier body having a cavity therein, and a lower mounting space, on the bottom of said cavity, for mounting at least one integrated circuit chip;

at least one bonding ledge having contact pads thereon in proximity to said mounting space inside said cavity;

at least one heat plate mounted above said lower mounting space within said cavity;

said heat plate being attached with low thermal resistance to said body of said chip carrier, said heat plate having a second mounting surface thereon for mounting at least one integrated circuit chip thereon;

at least one integrated circuit chip mounted on said lower mounting space, and at least one integrated circuit chip mounted on said second mounting surface;



a plurality of connecting leads linking contact pads on said integrated circuits to selected contact pads on said bonding ledges; and

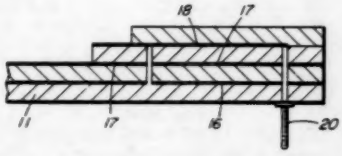
a lid hermetically sealed to said body of said chip cavity, said lid and said chip cavity enclosing therebetween said lower mounting space, said heat plate, and said chips mounted to said space and said heat plate;

wherein said heat plate comprises openings to expose plural ones of said contact pads on said bonding ledges.

4,943,845
THICK FILM PACKAGES WITH COMMON WAFER APERTURE PLACEMENT

John L. Wilby, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Aug. 2, 1988, Ser. No. 227,543
Int. Cl.[5] H01L 23/12, 23/14, 23/08
U.S. Cl. 357—74 6 Claims



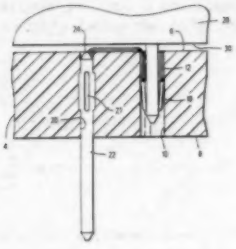
1. A multilayer thick film package for housing a microchip, the package being formed from a series of insulating wafers of corresponding external profile, an outer layer of the package being defined by a wafer in a first form having a first series of apertures therein adapted to be filled with electrically conductive material for connecting with pins adapted to extend from the package, each inner layer of the package being defined by a wafer in a second form having a second series of apertures therein adapted to be filled with electrically conductive material and corresponding in number and position with the apertures on each other inner layer, the second series of apertures comprising a series of apertures corresponding to the first series of apertures in number and position and also comprising a third series of apertures lacking such correspondence, electrical connections from the microchip to the package pins being adapted to be made by selective patterning of an electrically conductive coating on the first and second forms of wafer, whereby the packages for a variety of microchips can be prepared by utilizing a common first form of wafer and a common second form of wafer by varying the pattern of the electrically conductive coating on those wafers.

4,943,846

PIN GRID ARRAY HAVING SEPERATE POSTS AND SOCKET CONTACTS

David J. Shirling, Waterbury, Conn., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 9, 1989, Ser. No. 433,830
Int. Cl.[5] H01L *23/14, 23/12, 23/54*
U.S. Cl. 357—80 **7 Claims**



1. A pin grid array comprising a monolithic insulating support having oppositely facing first and second major surfaces, a first plurality of holes extending entirely through the support from the first surface to the second surface, the first holes being located on a first square grid, contact sockets in the first holes which are dimensioned to receive leads which extend from a component, and contact pins in the support extending from the second surface, each of the contact pins being electrically connected to an associated contact socket, the pin grid array being characterized in that:

a second plurality of holes are provided in the support, the second holes being located on a second square grid which is identical to the first grid and is offset, relative to the first grid, in the X and Y directions by amounts equal to one half of the grid spacing so that the second holes are offset from the first holes, each of the contact pins being mounted in one of the second holes, and

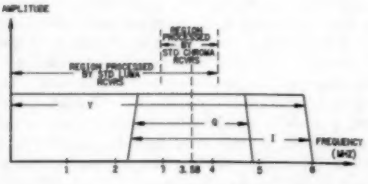
surface conductors on one of the surfaces, each conductor extending from one of the first holes to an associated second hole, the conductors serving to connect each of the socket contacts to its associated pin contact.

4,943,847

EXTENDED DEFINITION TELEVISION

Ron D. Katznelson, San Diego, Calif., assignor to M/A-COM Government Systems, Inc. and Cable/Home Communication Corp., both of San Diego, Calif.

Filed Sep. 19, 1986, Ser. No. 909,508
Int. Cl.[5] H04N *11/14*
U.S. Cl. 358—12 **10 Claims**



1. An NTSC-compatible television system in which wideband and narrowband chrominance components of a video signal are modulated in quadrature by a 3.58 MHz subcarrier, comprising

an encoder, including

means for filtering the wideband chrominance component over a first predetermined baseband bandwidth;

means for filtering the narrowband chrominance component over a second predetermined baseband bandwidth that is less than said first predetermined bandwidth;

means for modulating the filtered wideband chrominance component with a 3.58 MHz subcarrier;

means for modulating the filtered narrowband chrominance component in quadrature with subcarrier; and

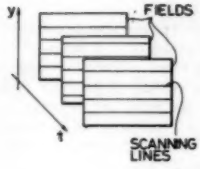
means for antisymmetrically filtering the modulated wideband chrominance component over an antisymmetrical bandwidth that extends above the subcarrier frequency by said first predetermined bandwidth and extends below said subcarrier frequency by said second predetermined bandwidth.

4,943,848

TELEVISION SIGNAL TRANSMISSION SYSTEM

Takahiko Fukinuki, Kokubunji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 26,281, Mar. 16, 1987, Pat. No. 4,745,460, which is a division of Ser. No. 578,528, Feb. 9, 1984, Pat. No. 4,660,072. This application Apr. 25, 1988, Ser. No. 186,033
Claims priority, application Japan, Mar. 18, 1983, 58-44238
The portion of the term of this patent subsequent to Apr. 21, 2004, has been disclaimed.
Int. Cl.[5] H04N *11/00*
U.S. Cl. 358—12 **11 Claims**



1. A color television signal transmission system having at least one of a transmission part for converting progressive scanning signals into interlaced scanning signals and a reception part for converting interlaced scanning signals into progressive scanning signals comprising:

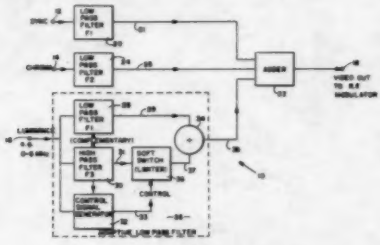
(a) first means including means for obtaining a NTSC signal having a frequency lower than a predetermined frequency from a video signal; means for obtaining an information signal having a frequency higher than the predetermined frequency from the video signal, means for shifting the information signal into a band of the NTSC signal so that the information signal exists in the first and third quadrants of temporal and vertical frequency coordinates while the color signals of the NTSC signal exists in the second and fourth quadrants of the temporal and vertical frequency coordinates, and means for producing an extended-NTSC signal by combining the NTSC signal and the shifted information signal; and

(b) second means including means for separating the NTSC signal and the shifted information signal from the extended-NTSC signal, means for inserting the shifted information signal in a band of the information signal, and means for reproducing the video signal by adding the separated NTSC signal and the information signal.

4,943,849
TELEVISION TRANSMISSION SYSTEM HAVING IMPROVED SEPARATION OF AUDIO AND VIDEO SPECTRA

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos, Calif. 94402, and Jack J. Campbell, 1161 De Haro St., San Francisco, Calif. 94110

Filed Sep. 1, 1988, Ser. No. 239,298
Int. Cl.[5] H04N 7/04
U.S. Cl. 358—12 34 Claims



1. A method for providing improved separation of audio and video spectra carried upon spectrally separated audio and video carriers within a television transmission channel leading to a television receiver, said method comprising the transmission steps of:

a. obtaining a high frequency luminance component at the vicinity of the audio carrier offset from the video carrier from a full bandwidth baseband luminance signal received from a video source;

b. limiting the amplitude of luminance energy groups within the high frequency component to be below a predetermined amplitude level;

c. combining the amplitude limited high frequency component into the full bandwidth luminance signal in a manner which provides a composite luminance signal having amplitude limited high frequency energy groups at the vicinity of the audio carrier;

d. adding video synchronizing information to the composite luminance signal to provide a single video modulation signal;

e. modulating said video carrier with said single video modulation signal;

f. combining said video carrier with said audio carrier into a resultant television composite; and,

g. passing the resultant television composite through said television transmission channel to the television receiver.

4,943,850
APPARATUS FOR LIMITING THE OUTPUT SIGNAL FREQUENCY BAND OF AN OPTICAL SENSOR

Takashi Asaida, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 12, 1988, Ser. No. 256,558
Claims priority, application Japan, Oct. 23, 1987, 62-267860
Int. Cl.[5] H04N 9/097
U.S. Cl. 358—55 10 Claims

1. Apparatus comprising:

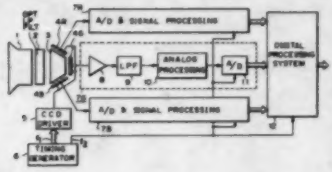
an optical low-pass filter;

solid-state image sensing means for receiving an image obtained through said optical low-pass filter;

signal processing means connected to said solid-state image sensing means and including an analog-to-digital converter and an electrical low-pass filter;

digital signal processing means connected to said signal processing means for digitally processing an image signal output from said signal processing means and;

a pulse signal generator for generating a first pulse signal having a frequency f1 for driving said solid-state image sensing means and a second pulse signal having a frequency f2 for driving said digital signal processing circuit, f1 being greater than f2, and said optical low-pass filter having a frequency characteristic to depress a frequency

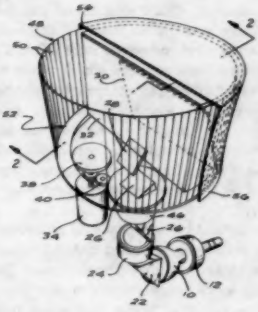


component of the image signal located between a frequency of f1−½ f2 and the frequency of f1, and said electrical low-pass filter having a frequency characteristic to depress a frequency component of the image signal greater than ½ f2.

4,943,851
360 DEGREE VIEWING SYSTEM HAVING A LIQUID CRYSTAL DISPLAY SCREEN ENCIRCLING A ROTATABLE PROJECTION SCREEN

Paul W. Lang, and Franklin C. Gribshaw, both of Orange, Calif., assignors to Gold Stake; C. Allen Jensen and Gregory D. Levy, all of Pasadena, Calif.

Filed Mar. 7, 1989, Ser. No. 320,289
Int. Cl.[5] H04N 9/16
U.S. Cl. 358—87 41 Claims



1. A 360° viewing apparatus, comprising:

a projection screen;

means for rotating the projection screen;

an optical system for continuously projecting an image onto the projection screen;

a liquid crystal display (LCD) screen encircling the projection screen, the LCD screen defining a viewing window through which the image on the projection screen can be viewed, wherein the viewing window is continuously redefined about the LCD screen in synchronization with rotation of the projection screen such that the viewing window is continually aligned with the projection screen; and

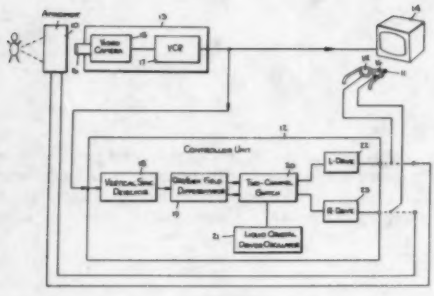
means for synchronizing the continuous redefinition of the viewing window around the LCD screen with the rotation of the projection screen.

4,943,852

STEREOSCOPIC CONVERTER ASSEMBLY FOR CLOSED CIRCUIT 2-D TELEVISION SYSTEM

Philip A. Femano, Nutley, and Michael F. Zanakis, Livingston, both of N.J., assignors to Eclectica, Inc., Nutley, N.J.

Filed Oct. 6, 1988, Ser. No. 254,166
Int. Cl.[5] H04N *13/00*
U.S. Cl. 358—88 **9 Claims**



1. A stereoscopic converter assembly usable in conjunction with a 2-D TV system constituted by a video camera section having a monocular lens to yield a composite video signal representing an image of a scene viewed by the lens, a video cassette recorder section operable in a recording mode to record the composite video signal yielded by the camera section and in a playback mode to feed this signal to a TV monitor on whose screen the recorded image is exhibited, said video camera section and said recorder section being unified to form a battery-powered camcorder usable at a site remote from the monitor and being provided with a camera section output and a recorder section output, said converter comprising:

(a) a self-sufficient optical attachment joinable to said camcorder for placement in front of the lens of the video camera section and provided with left and right eye voltage-activated light shutters which when alternately activated present to the lens alternate left and right eye images of a scene, said camcorder and said attachment being detachably supported in operative relation on a mount;

(b) an electro-optical viewer provided with left and right eye voltage-activated light valves through which the images exhibited on the screen of the monitor are viewed by an observer;

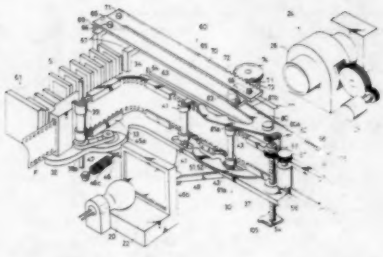
(c) a self-sufficient battery-powered controller unit usable at said site selectively coupled either to the optical attachment or to the electro-optical viewer, the unit in said recording mode being coupled to the output of the video camera section and being responsive to the composite video signal yielded thereby to apply activating voltages alternately to said right and left shutters of the attachment whereby there is then recorded in the recorder section left and right eye images of the scene, the unit in said playback mode in which the recorded left and right eye images are exhibited on the screen being coupled to the output of the recorder section and then being responsive to the composite video signal yielded by the recorder section to apply activating voltages alternately to the left and right eye valves of the viewer to present the left and right eye images on the screen alternately to the left and right eyes of an observer, the corresponding screen images, thereby affording stereoscopic vision, whereby when the converter is combined with said camcorder, the combination functions as a 3-D TV system, and when said converter is removed from the camcorder, the system reverts to a 2-D TV system.

4,943,853

TV VIEWER

Tahei Morisawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1988, Ser. No. 210,552
Claims priority, application Japan, Jun. 26, 1987, 62-159010; Jul. 10, 1987, 62-172447; Jul. 10, 1987, 62-172448; Jul. 15, 1987, 62-176628; Jul. 15, 1987, 62-176629
Int. Cl.[5] H04N *5/253*
U.S. Cl. 358—102 **25 Claims**



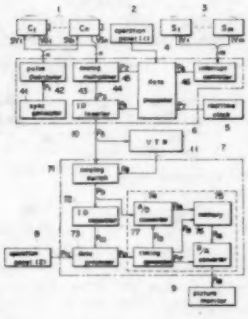
1. A TV viewer comprising a light source and an image pick-up device which is spaced from the light source by a predetermined distance, a film holding plane and a slide holding plane which are spaced from one another along an optical axis direction of the image pick-up device, said planes being located between the light source and the image pick-up device, a film feeding device for feeding film to the film holding plane, and a slide feeding device for feeding at least one slide to the slide holding plane.

4,943,854

VIDEO SURVEILLANCE SYSTEM FOR SELECTIVELY SELECTING PROCESSING AND DISPLAYING THE OUTPUTS OF A PLURALITY OF TV CAMERAS

Tsuneo Shiota, and Soji Takeuchi, both of Hachioji, Japan, assignors to Chuo Electronics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 86,248, Aug. 13, 1987, abandoned, which is a continuation of Ser. No. 873,744, Jun. 12, 1986, abandoned. This application Nov. 17, 1985, Ser. No. 273,119
Claims priority, application Japan, Jul. 26, 1985, 60-139750
Int. Cl.[5] H04N *7/18*
U.S. Cl. 358—108 **7 Claims**



1. A multi-video surveillance system for the surveillance of a plurality of positions, comprising:

a plurality of TV cameras for producing a plurality of first video signals corresponding to scenes of said positions;

control means for sequentially selecting the outputs of said TV cameras to produce a single video output signal, said control means comprising means for controlling the relative information content of each of said first video signals presents in said second video output signal;

sensing means for producing output signals in response to the determination of the occurrence of non-occurence of a predetermined physical event at least one of said positions;

data processing means responsive to said input signals of said sensing means to provide output signals for controlling said means for controlling the relative information content to change the relative information content of said first video signals present in said second video output signal;

said means for controlling said relative information content being responsive to said output signals of said data processing means for sequentially selecting relative numbers of field, frame or multiple frame video signal outputs of each of said TV cameras in a first predetermined proportion, means for producing first time-division multiplex signals therefrom in which the relative information content from each of said TV cameras is a function of said first predetermined proportion, and means responsive to the output of said sensing means for changing the relative numbers of field, frame or multiple frame video signal outputs;

said means for producing first time-division multiplex signals further comprising means for adding control signals to said first time-division multiplex signals to produce second time-division multiplex signals, said control signals comprising signals associated with the fields for identifying the respective TV cameras, relative information content of the first video signals and information corresponding to the output signals of said sensing means, whereby said second time-division multiplex signals are comprised of sequential field, frame or integral number of frame signals each derived from the respective TV cameras in a proportion controlled by said means for controlling said relative information content;

video recording means for recording said second time-division multiplex signals;

selection means for producing second selection signals corresponding to desired surveillance information;

means for reproducing signals corresponding to still scenes or series of continuous still scenes, said reproducing means comprising means for comparing said second selection signals with control signals on said second time-division multiplex signals for selecting desired scene signals from said second time-division multiplex signals; and

display means for displaying scenes corresponding to the signals reproduced by the reproducing means;

said reproducing means comprising an input selection circuit, said input selection circuit comprising means for selectively applying the output of said means for adding control signals or the output of said video recording means to said reproducing means, whereby the display means can selectively display current scenes or scenes recorded by said video recording means.

4,943,855

PROGRESSIVE SUB-BAND IMAGE CODING SYSTEM

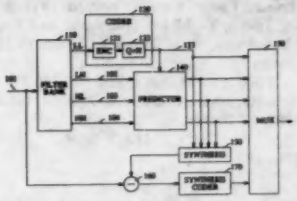
Hemant Bheda, Freehold, and Adrianus Ligtenberg, Oceanport, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 22, 1988, Ser. No. 222,987
Int. Cl.[5] H04N *7/13*
U.S. Cl. 358—133 **13 Claims**

1. An image encoder comprising:

filter bank means responsive to an applied image signal for developing a plurality of sub-band image signals;

coder means responsive to a selected one of said sub-band image signals for encoding said selected sub-band image signal to reduce data redundancy contained in said selected sub-band image signal; and



prediction means responsive to other ones of said sub-band image signals and to said means for encoding for developing predictive signals corresponding to said other sub-band image signals.

4,943,856

METHOD AND APPARATUS FOR INTRODUCING A PAN AND SCAN FEATURE TO HIGH DEFINITION TELEVISION SYSTEMS

Michael Bakhmutsky, Spring Valley; Alan P. Cavallerano, Ossining; Mikhail Tsinberg, Bronx, and Carlo Basile, Flushing, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 199,962, May 27, 1988, abandoned, and a continuation-in-part of Ser. No. 57,847, Jun. 2, 1987, Ser. No. 57,848, Jun. 2, 1987, and Ser. No. 57,849, Jun. 2, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 330,941
Int. Cl.[5] H04N *7/04, 11/06*
U.S. Cl. 358—141 **12 Claims**

1. A method for encoding a high definition television (HDTV) picture to comprise a plurality of scan lines divided into a plurality of components of variable proportions each having a plurality of pixels in order to provide a pan and scan capability to a system for transmitting and receiving an HDTV signal, said method comprising the steps of:

(a) generating a plurality of data words representing the proportional relationship between said components;

(b) multiplying the pixels of said HDTV picture by a plurality of respective attenuation factors ranging in magnitude from zero to one inclusive, under the control of said data words so as to generate a coefficient-multiplied video signal representing a center portion and a plurality of panels of varying dimensions corresponding to the proportions of said components; and

(c) combining said coefficient-multiplied video signal with said plurality of data words to form said HDTV signal.

4,943,857

SYNCHRONIZING CIRCUIT FOR AN EXTERNAL SIGNAL AND AN INTERNAL SAMPLING CLOCK SIGNAL

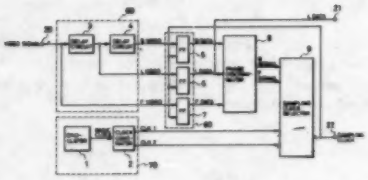
Nobuaki Izuno; Yasuo Kurosu, both of Yokohama; Koichi Okazawa, Tokyo; Yoshihiro Yokoyama, and Kensuke Ooyu, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,394

Claims priority, application Japan, Apr. 24, 1987, 62-102625; Nov. 13, 1987, 62-286738

Int. Cl.[5] H04N 5/04

U.S. Cl. 358—148 **5 Claims**



1. A synchronizing circuit for synchronizing an input video signal with a sampling clock signal, comprising:

delay means for delaying the input video signal by a plurality of delay amounts to produce a plurality of delayed video signals, each having the same waveform as said input video signal;

detecting means connected to said delay means for detecting phase relations between the sampling clock signal and each of said delayed video signals;

phase discriminating means connected to said detecting means for outputting an output signal representing said phase relations detected by said detecting means;

means for supplying two kinds of clock signals having the same frequency and a phase difference of 180 degrees; and

selecting means for selecting one of said two clock signals and for outputting the selected clock signal as the sampling clock signal, said selecting means either converting the sampling clock signal to the non-selected clock signal at the trailing edge of the non-selected clock signal or converting the sampling clock signal to the non-selected clock signal at the trailing edge of the selected clock signal in response to the output signal outputted by said phase discriminating means.

4,943,858

TV SIGNAL RECORDING AND REPRODUCING APPARATUS EMPLOYING A DIGITAL INTERFACE AND INCLUDING SIGNAL DROP-OUT COMPENSATION

Hiromu Kitaura, Osakasayama; Yuichi Ninomiya; Yoshimichi Ohtsuka, both of Kawasaki, and Yoshinori Izumi, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1989, Ser. No. 314,089

Int. Cl.[5] H04N 5/213, 9/88, 5/94

U.S. Cl. 358—167 **3 Claims**

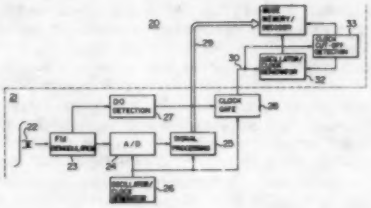
1. A drop-out compensation apparatus for a recording and reproduction system comprising:

a receiver for receiving digital image data from said recording and reproducing system, said receiver comprising means for decoding received image data and a reference oscillator clock generator for controlling said decoding means;

means for supplying said receiver with a clock signal and a set of digital image data for an image signal reproduced and processed by said recording and reproducing system, said clock signal being supplied to said reference oscillator clock generator to control the phase and frequency thereof and said image data being supplied to said decoding means;

means for interrupting the supply of said clock signal to said reference oscillator clock generator for the period of a drop-out, if any, in the recording and reproducing system;

said receiver further comprising means for detecting an interruption in the supply of said clock signal to said



reference oscillator clock generator for causing said decoding means to compensate for said drop-out by using previously stored image data and for causing said reference oscillator clock generator to hold a frequency and phase determining control signal to the value thereof immediately preceding the interruption in the supply of said clock signal.

4,943,859

CIRCUIT FOR PRODUCING CLAMP PULSE HAVING PULSE WIDTH RESPONSE TO THE FREQUENCY OF A SYNCHRONIZING SIGNAL

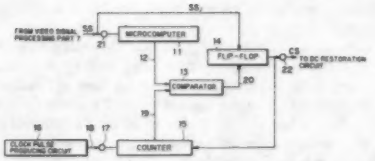
Noriaki Matsuo, Asahi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1989, Ser. No. 341,628

Claims priority, application Japan, Jul. 27, 1988, 63-185448

Int. Cl.[5] H04N 5/16, 5/18, 9/72

U.S. Cl. 358—172 **8 Claims**



1. A clamp pulse producing circuit contained in DC restoration means for produce a clamp pulse for use in restoring a DC component lost from a video signal, comprising:

a first input means for receiving a synchronizing signal included in said video signal;

pulse width data output means connected to said first input means for outputting pulse width data responsive to a frequency of said synchronizing signal;

a flip-flop having first and second output states, which is connected to said first input means to enter the first output state in response to a trailing edge of said synchronizing signal;

measuring means connected to said flip-flop for measurinig a period of said first output state of said flip-flop to output a result of measurement; and

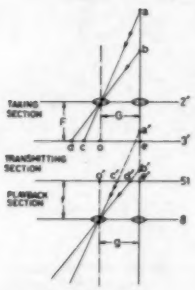
judging means connected to said pulse width data output means, said measuring means and said flip-flop for judging whether or not said pulse width data coincides with said result of measurement to output a first signal for bringing said flip-flop into said second output state upon a judgement on coincidence.

4,943,860

THREE-DIMENSIONAL PHOTOGRAPHING AND THREE-DIMENSIONAL PLAYBACK DEVICE BY SPATIAL TIME-SHARING METHOD

Tomohiko Hattori, 6-12, Daikou-cho 3-chome, Higashi-ku, Nagoya-shi, Aichi-ken, Japan

Filed Mar. 28, 1989, Ser. No. 329,824
Claims priority, application Japan, Apr. 1, 1988, 63-81480
Int. Cl.[5] H04N *13/00*
U.S. Cl. 358—88 **4 Claims**



1. A three-dimensional photographing and three-dimensional playback device by spatial time sharing method comprising:

a taking section composed of a convex lens, an image pickup screen and a pin hole movable on a surface or through an inner part of said convex lens, the distance between said convex lens and said image pickup screen being equal to the focal length of said convex lens; and

a playback section composed of a lens member selected out of a cylindrical lens and a convex lens, an image output screen and a narrow opening member selected out of a vertical slit and a pin hole, which is movable on a surface or through an inner part of said lens member, the distance between said lens member and said image output screen being equal to the focal length of said lens member:

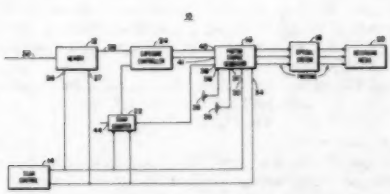
said pin hole in said taking section and said narrow opening member in said playback section being scanned in synchronization.

4,943,861

APPARATUS AND METHOD FOR EXPOSING PHOTOSENSITIVE RECORDING MEDIA WITH DIGITAL IMAGE DATA

Thomas W. Lambert, Dousman, Wis., assignor to Analogic Corporation, Peabody, Mass.

Filed Mar. 3, 1987, Ser. No. 21,308
Int. Cl.[5] H04N *5/84*; G11B *7/00*
U.S. Cl. 358—244 **13 Claims**



1. Apparatus for recording an image on photon sensitive recording media, comprising:

a source of image pixel data in digital form having a multiplicity of possible intensity values which multiplicity of intensity values are multiples of a lowest intensity value greater than zero;

photon generator means for exposing the photon sensitive recording media at a first fixed intensity level corresponding to the lowest intensity value greater than zero, of the pixel data, and at a second fixed intensity level which is a multiple of the first fixed intensity level; and

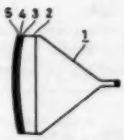
means for controlling the amount of time of exposure of the recording media at the first and second intensity levels in correspondence with the pixel data intensity values from the source.

4,943,862

CATHODE-RAY TUBE WITH MULTI-LAYER RESIN COATING ON FACEPLATE PROVIDING IMPLOSION PROTECTION

Kazuo Uesaka; Akira Yamada; Kazuyoshi Teramoto; Itsuo Nishiyama, and Kousuke Haraga, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1988, Ser. No. 155,597
Claims priority, application Japan, Feb. 12, 1987, 62-30026
Int. Cl.[5] H01J *29/87*; H04N *5/64*
U.S. Cl. 358—245 **12 Claims**



1. An implosion protected cathode ray tube which comprises a glass envelope having a faceplate; and a layered protective structure deposited over and positioned frontwardly of the faceplate, said layered protective structure including a first resin-coated layer held in contact with the faceplate, a hard coated layer for protecting the first resin-coated layer and a second resin-coated layer formed between the first resin-coated layer and the hard coated layer, said first resin-coated layer having a hardness which corresponds to 1H or lower of hardness of drafting pencil lead, and an elongation at breakage within the range of 65 to 85%, said first resin-coated layer also having a break strength of 3.5 kilograms per square millimeter or greater, said hard coated layer having a hardness which corresponds to 5H or higher of hardness of drafting pencil lead, and an elongation of 3% or smaller at breakage, and said second resin-coated layer having a hardness generally intermediate between the hardness of the first resin-coated layer and that of the hard coated layer and also an elongation at breakage generally intermediate between the elongation of the first resin-coated layer at breakage and that of the hard coated layer at breakage.

4,943,863

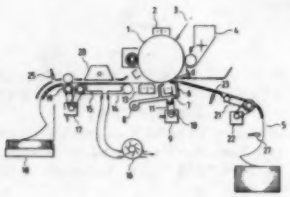
ELECTROPHOTOGRAPHIC PRINTER

Masayuki Ainoya, Katsuta, Japan, assignor to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1989, Ser. No. 400,623
Claims priority, application Japan, Sep. 2, 1988, 63-220745
Int. Cl.[5] G03G *15/14*, *21/00*
U.S. Cl. 355—271 **6 Claims**

1. In an electrographic printer for printing an image on a continuous printing sheet having a leading edge and a tail edge, the printer including a photosensitive drum which provides a toner image on its surface, a tractor for feeding the continuous printing sheet to the photosensitive drum the tractor having a given sheet feeding speed, a guide member positioned at an

image transfer position and disposed movable toward and away from the photosensitive drum for providing an intimate contact of the printing sheet with the photosensitive drum so as to transfer the toner image to the printing sheet, a gap being defined between the guide member and the photosensitive drum and toner image transfer section being defined between the photosensitive drum and the guide member, a fixing section for fixing a transferred toner image on the printing sheet, a



sheet stacker and a feed roller for feeding an image fixed sheet to the sheet stacker; the improvement comprising:

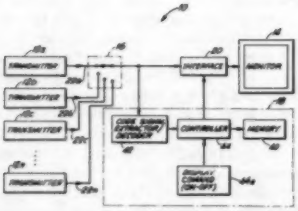
means for changing the gap between the guide member and the photosensitive drum, the changing means enlarging the gap until the leading edge of the printing sheet passes through the feed roller, and reducing the gap after the leading edge passes through the feed roller, whereby printing to the leading edge portion is performed.

4,943,864

CLOSED CIRCUIT TELEVISION APPARATUS FOR SUPERVISORY SYSTEM

David Elberbaum, Tokyo, Japan, assignor to Elbex Video, Ltd., Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,579
Claims priority, application Japan, Feb. 25, 1988, 63-40617
Int. Cl.[5] H04N *7/18, 5/268, 7/10*
U.S. Cl. 358—108 **7 Claims**



1. A closed circuit television apparatus comprising:

a plurality of transmitting means for generating video signals;

a receiving means for receiving said video signals;

a switching means for selectively connecting said transmitting means to the receiving means;

each of said transmitting means including a television camera to which a specific code is allotted, a circuit for generating code signals corresponding to said specific code, and a circuit for generating composite signals wherein the code signals are injected into the video signals; and

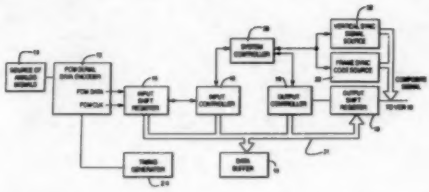
said receiving means including a circuit for receiving said composite signals, for extracting said code signals from the received composite signals and for generating display signals identifying the television camera corresponding to the extracted code signals, and a receiver for displaying visually information corresponding to said display signals together with reproduced images or pictures corresponding to said video signals.

4,943,865

METHOD AND SYSTEM FOR RECORDING STANDARD PULSE CODE MODULATED SERIAL DATA USING VIDEO SIGNAL RECORDERS

John C. Hales, Renton, and Everett J. Nelson, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 8, 1987, Ser. No. 105,574
Int. Cl.[5] H04N *5/782*
U.S. Cl. 358—335 **13 Claims**



1. A method of recording on a video signal recorder a serialized stream of pulse code modulated digital data bits, the video signal recorder having multiple record/playback heads and being of the type normally adapted to record video signals such as television signals under the control of vertical and horizontal synchronizing signals included in the video signals, said method comprising the steps of:

successively applying data frames having a predetermined number of data bits of the serialized stream of pulse code modulated digital data bits at a given frequency to a data buffer;

increasing the frequency of the data bits of the data frames outputted from the data buffer thereby compressing in time the data frames;

developing buffer zones of filler bits providing predetermined periods of time between successive data frames;

inserting in the buffer zones vertical and horizontal synchronizing signals for controlling the timing of switching events between recording heads to occur within the predetermined periods of time and frame synchronizing codes of a predetermined number of bits for locating the data frames during playback wherein the serialized data stream can be recreated; and

applying as a composite signal successive buffer zones, including the inserted vertical and horizontal synchronizing signals and frame synchronizing codes, and the compressed data frames to a video signal recorder for recording thereby.

4,943,866

VIDEO COMPOSITION METHOD AND APPARATUS EMPLOYING SMOOTH SCROLLING

Ronald C. Barker, Weston; Chester L. Schuler, Sudbury; Kenneth C. Kiesel, Wayland, and Edwin C. Moxon, Boxboro, all of Mass., assignors to Lex Computer and Management Corporation, New York, N.Y.

Continuation of Ser. No. 556,537, Dec. 2, 1983. This application Jun. 16, 1989, Ser. No. 367,767
Int. Cl.[5] H04N *5/76*
U.S. Cl. 358—335 **9 Claims**

1. Apparatus for composing image source material stored on at least one image storage medium, said source material being composed of a sequence of stored frames representing a time sequential visual image, sequences of said frames being associated to form a video segment, said composing apparatus comprising:

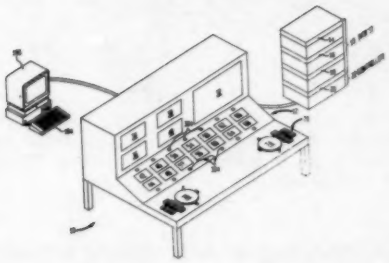
a plurality of pictorial display means arranged in an ordered array, each display means providing a visual presentation

of a video label selected from a sequence of labels, said label sequence representing a sequence of said video segments, each said selected label identifying one said video segment;

an operator control means;

a composing control means operative with said medium and said operator control means, said composing control means comprising;

means for selectively supplying each said pictorial display means with electrical data signals representing a selected one of said sequence of labels;



means responsive to said operator control means for changing the labels displayed by said plurality of pictorial display means; and

said supplying means further having means responsive to said changing means for smoothly scrolling said labels across said ordered array of display means, wherein said smoothly scrolling refers to that motion wherein it appears as though said labels were frames of a continuous imaginary film strip which was moved at a constant rate behind openings corresponding to said ordered array of said plurality of pictorial display means.

4,943,867

ELECTRONIC STILL CAMERA

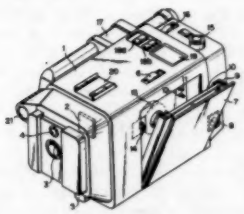
Hiroyuki Suetaka, Higashimurayama, and Shigeki Kurahashi, Akishima, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Division of Ser. No. 131,662, Dec. 11, 1987, abandoned. This application Sep. 26, 1989, Ser. No. 413,438

Claims priority, application Japan, Dec. 18, 1986, 61-193677; Dec. 18, 1986, 61-299976

Int. Cl.[5] H04N *5/781*

U.S. Cl. 358—342 **15 Claims**



1. An electronic still camera comprising:

(a) optical means for forming an optical image;

(b) image sensing means for converting the optical image into an electronic signal;

(c) recording medium housing means for housing a recording medium having a number of recording areas on which still image data is recorded;

(d) designating means for designating one of the recording areas of said recording medium;

(e) area data memory means for storing area data representing a recording area designated by said designating means;

(f) recording control means for converting the electronic signal obtained from said image sensing means into still image data and recording the still image data in the recording area designated by said designating means;

(g) first operating switch means for causing the recording control means to record the still image data in only one of the recording areas;

(h) second operating switch means for sequentially updating the recording area designated by said designating means at predetermined time intervals and causing said recording control means to sequentially record the still image data in the updated recording area;

(i) reproducing control means for reproducing the still image data recorded on the recording area designated by said designating means;

(j) third operating switch means for causing said reproducing control means to reproduce the still image data from only one of the recording areas; and

(k) fourth operating switch means for sequentially updating the recording areas designated by said designating means at the same time intervals as said predetermined time intervals and causing said reproducing control means to reproduce the still image data from the update of the recording area to the next update thereof.

4,943,868

HANDY IMAGE DATA FILING APPARATUS

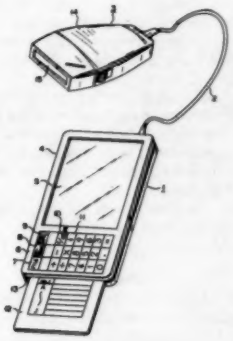
Yoshio Yoshinaga, Mitaka; Wataru Shimizu, Kodaira, and Toshio Obara, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 23, 1989, Ser. No. 314,170

Claims priority, application Japan, Mar. 1, 1988, 63-48290; Mar. 1, 1988, 63-48291

Int. Cl.[5] H04N *1/00*

U.S. Cl. 358—403 **19 Claims**



1. A handy image data filing apparatus comprising:

image data reading means for reading image data on an object;

entry means for entering retrieval data which identifying the image data;

IC memory means, removably set to the apparatus, for storing the image data;

storage control means for storing into said IC memory means the image data read by said image data reading means together with the retrieval data entered by said entry means;

read control means for reading out the image data from said

IC memory means according to said retrieval data entered from said entry means;

display means for displaying the image data read out by said read control means; and

portable housing means for containing said entry means, said storage control means, said read control means, and said display means.

4,943,869

COMPRESSION METHOD FOR DOT IMAGE DATA

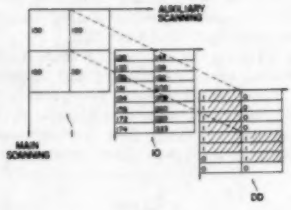
Hiroshi Horikawa; Hitoshi Urabe, and Katsutoshi Yako, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 4, 1988, Ser. No. 190,189

Claims priority, application Japan, May 6, 1987, 62-110331; May 6, 1987, 62-110332

Int. Cl.[5] H04N *1/41*

U.S. Cl. 358—426 **14 Claims**



1. A compression method for dot image data of the type wherein an image signal is comprised of a plurality of pixel density levels, each corresponding to a density level of a different pixel, said method comprising the steps of:

providing a threshold matrix means having n (where n is an integer value) threshold matrix values associated with each pixel, said threshold matrix means for converting said image signal to digital dot data by comparing each said pixel density level to said n threshold matrix values associated with that pixel, to produce, for each pixel, n bits of digital dot data which are re-arranged for each respective said pixel in accordance with a predetermined reference obtained from threshold matrix values of the respective said pixel,

compressing said digtial dot data by counting data having the same continuous logical values, from at least one of a top and an end of the dot data thus obtained, in increments of a predetermined unit so as to produce compression data corresponding to a number of units from the at least one of a top and end thereof, and

leaving digital dot data which are not compressed in said compressing step in un-encoded form.

4,943,870

IMAGE MAGNIFY/REDUCE APPARATUS

Kiyohisa Sugishima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 116,255, Nov. 3, 1987, abandoned. This application Oct. 30, 1989, Ser. No. 428,415

Claims priority, application Japan, Nov. 10, 1986, 61-265651

Int. Cl.[5] H04N *1/04, 1/17*

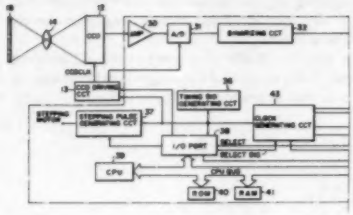
U.S. Cl. 358—451 **19 Claims**

1. An image magnifying and/or image reducing apparatus comprising:

image signal generating means for generating an image signal in units of a line; and

processing means for processing an image signal generated in units of a line by said image signal generating means,

wherein said processing means includes at least one of (1) means for magnifying and (2) means for reducing an image signal generated in units of a line, to output a variably-magnified or variably-reduced signal, respectively, and said magnifying means or reducing means, respectively, is



capable of changing a magnifying or reducing factor, respectively, by gradation for each N lines, N being a positive integer.

4,943,871

IMAGE READ-OUT AND REPRODUCING APPARATUS

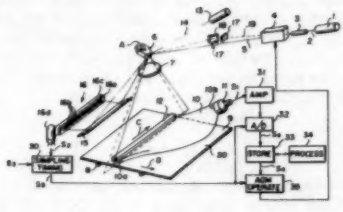
Ichirou Miyagawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 17, 1989, Ser. No. 324,882

Claims priority, application Japan, Mar. 19, 1988, 63-66749

Int. Cl.[5] H04N *1/12*

U.S. Cl. 358—496 **6 Claims**



1. An image read-out and reproducing apparatus comprising:

(i) a read-out means for scanning a recording medium, on which image information has been recorded, in a main scanning direction with reading light which has impinged from a first direction upon a light deflector and been reflected and deflected thereby, the main scanning being carried out a large number of times, moving said recording medium in a sub-scanning direction, which is approximately normal to the main scanning direction, with respect to said reading light, and obtaining an image signal representing the image information by detecting light which is emitted by said recording medium in response to the reading light during the main scanning and the sub-scanning,

(ii) a reproducing means for scanning a recording sheet, which is capable of reproducing image information thereon, in the main scanning direction with reproducing light which has impinged from a second direction different from said first direction upon said light deflector and been reflected and deflected thereby, the main scanning being carried out a large number of times, moving said recording sheet in the sub-scanning direction with respect to said reproducing light, and reproducing an image on said recording sheet by using said image signal, and

(iii) a monitor light detector extending in a direction corre-

sponding to the main scanning direction in order to monitor positions of said reading light and said reproducing light on main scanning lines of the recording medium and the recording sheet, respectively, by being exposed to monitor light which has impinged from a third direction different from said first and second directions upon said light deflector and been reflected and deflected thereby, and detecting said monitor light,

wherein read out in each main scanning is started when said monitor light is irradiated onto a first position on said monitor light detector, and

reproduction in each main scanning is started when said monitor light is irradiated onto a second position on said monitor light detector,

so that a position at which read out is started in each main scanning with said reading light and a position at which reproduction is started in each main scanning with said reproducing light approximately coincide with each other in the main scanning direction.

4. An image read-out and reproducing apparatus comprising:

(i) a read-out means for scanning a recording medium, on which image information has been recorded, in a main scanning direction with reading light which has impinged from a first direction upon a light deflector and been reflected and deflected thereby, the main scanning being carried out a large number of times, moving said recording medium in a sub-scanning direction, which is approximately normal to the main scanning direction, with respect to said reading light, and obtaining an image signal representing the image information by detecting light which is emitted by said recording medium in response to the reading light during the main scanning and the sub-scanning,

(ii) a reproducing means for scanning a recording sheet, which is capable of reproducing image information thereon, in the main scanning direction with reproducing light which has impinged from a second direction different from said first direction upon said light deflector and been reflected and deflected thereby, the main scanning being carried out a large number of times, moving said recording sheet in the sub-scanning direction with respect to said reproducing light, and reproducing an image on said recording sheet by using said image signal, and

(iii) a monitor light detector extending in a direction corresponding to the main scanning direction in order to monitor positions of said reading light and said reproducing light on main scanning lines of the recording medium and the recording sheet, respectively, by being exposed to monitor light which has impinged from a third direction different from said first and second directions upon said light deflector and been reflected and deflected thereby, and detecting said monitor light,

wherein a main-scanning start edge detector is located prior to points at which each main scanning with said reading light on a main scanning line and each main scanning with said reproducing light on a main scanning line are started.

read out in each main scanning is started a first predetermined time after said reading light is irradiated onto said main-scanning start edge detector, and

reproduction in each main scanning is started a second predetermined time after said reproducing light is irradiated onto said main-scanning start edge detector,

so that a position at which read out is started in each main scanning with said reading light and a position at which reproduction is started in each main scanning with said reproducing light approximately coincide with each other in the main scanning direction.

4,943,872

SYSTEM OF FAST REPRODUCTION AT NON-INTEGRAL MULTIPLE OF NORMAL PLAYBACK SPEED

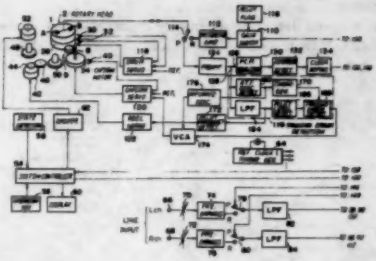
Shohei Yamazaki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 151,257, Feb. 1, 1988, abandoned. This application Aug. 18, 1989, Ser. No. 396,736

Claims priority, application Japan, Feb. 4, 1987, 62-24273

Int. Cl.[5] G11B 5/00, 5/09

U.S. Cl. 360—8 **4 Claims**



1. A magnetic recording and reproducing device, comprising:

a rotary head incorporating plural heads having different azimuths for recording and reproducing an input signal by tracing a magnetic tape, the recorded magnetic tape including predetermined portions containing sub-code information separate from other information;

processing means for separating the sub-code information from the other information during reproduction from the magnetic tape; and

tape feeding drive means for feeding the magnetic tape during an increased speed reproduction with a substantially constant tape feeding speed within a range of about $N + \frac{1}{4}$ to about $N + \frac{3}{4}$ (where N is an integer not including zero) times a tape feeding speed during a normal speed reproduction, whereby sub-code information recorded in sub-code regions of the magnetic tape can be reproduced substantially in real-time.

4,943,873

ROTARY HEAD TYPE DIGITAL-AUDIO REPRODUCING DEVICE WITH IMPROVED TRACK-DEVIATION DETECTING SYSTEM

Ken-ichiro Kawasaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 21, 1987, Ser. No. 98,826

Claims priority, application Japan, Sep. 20, 1986, 61-220837

Int. Cl.[5] G11B 5/584

U.S. Cl. 360—77.15 **23 Claims**

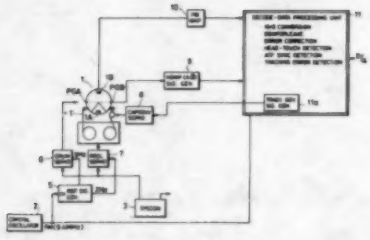
1. In a rotary head type digital-audio reproducing system comprising means for reading a plurality of signals, including digital signals, tracking pilot signals (f_1) and SYNC signals (f_2, f_3) said plurality of signals being recorded on each of at least first, second and third adjacent, oblique tracks in a longitudinal direction on a recording medium, said tracking pilot signals and said SYNC signals being recorded, in each of a plurality of recording regions, at various predetermined locations along said tracks and in a predetermined pattern with respect to said recording regions, said recording regions being independent of each other with respect to the longitudinal direction, and said second adjacent rack being provided in between said first and third adjacent tracks, said means for reading including two rotary heads (A, B) each being provided for reading said plurality of signals, within a predetermined width, recorded on

said recording medium, and providing an output including a reproduction of one of said adjacent tracks, said predetermined width being larger than a width of at least said second adjacent track,

wherein the locations of the recording patterns of said pilot signals and said SYNC signals recorded on said first, second and third adjacent tracks differ from each other, cross talk of said pilot signals on said first and third tracks is present in said output of each of said rotary heads, and a servo means is provided for controlling each of said rotary heads to operate on-track track in response to a level of a difference of said cross talk of said pilot signals on said first and third adjacent tracks,

the improvement comprising:

pilot signal detecting means for detecting a rise in said pilot signals from said output of a respective one of said rotary heads;



holding means for sampling and holding a level of said cross talk of said pilot signals on said first adjacent track in response to sampling signals; and

means responsive to an output from said pilot signal detecting means for generating said sampling signals after a predetermined period has passed from detection of said rise in said pilot signals by said pilot signal detecting means.

wherein said servo means is controlled by generating a signal exhibiting a quantity of track-deviation from a track being read by one of said rotary heads, said track being read corresponding to said second track, said quantity of track-deviation corresponding to the level held by said holding means and a level of said cross talk of said pilot signals on said third adjacent track after an elapsed time which is measured from said sampling and becomes equal to said predetermined period.

4,943,874

TAPE TENSION CONTROLLER FOR A CASSETTE RECORDING/PLAYBACK APPARATUS

Hidekazu Takeda, Katuta; Kyuichirou Nagai, Fujisawa; Kenji Ogiro, Yokohama; Mitsuji Aman, Mito, and Kouhei Takita, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 930,353, Nov. 13, 1986, abandoned. This application Oct. 12, 1988, Ser. No. 258,103

Claims priority, application Japan, Nov. 13, 1985, 60-252874

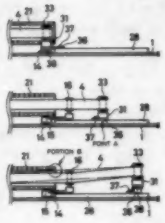
Int. Cl.[5] G11B *15/32*

U.S. Cl. 360—85 **7 Claims**

1. A magnetic tape recording/reproducing apparatus adapted for receiving a tape cassette wherein the cassette has upper and lower walls and an opening for withdrawing the tape from the cassette, the upper and lower walls having inner surfaces adjacent the tape, and wherein the tape is contained on a supplying reel having a reel base supported for rotation between the walls, comprising:

a chassis and a head cylinder having a cylindrical wall mounted on said chassis for recording and/or reproducing signals on the tape, said cylinder wall having a tape path that changes the height of the tape transverse to the direction of travel of the tape as the tape travels around the cylinder wall;

tape loading means for withdrawing the tape from the cassette from the cassette opening and guiding the tape toward the head cylinder and for winding the tape onto the cylindrical wall so that an edge of the tape adjacent



one of said upper and lower cassette walls is wound onto the cylindrical wall of the head cylinder at a point that differs in height from the corresponding inner surface of said one cassette wall; and

means mounted on said chassis between the opening of the cassette and the head cylinder for preventing engagement of said edge of the tape with the inner surface of said one cassette wall.

4,943,875

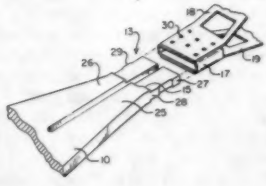
MAGNETIC DISK FILE HEAD SUSPENSION ASSEMBLY MOUNTING MEANS

John R. Reidenbach, and Robert E. Schopp, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 13, 1988, Ser. No. 257,256

Int. Cl.[5] G11B *5/49, 21/16*

U.S. Cl. 360—104 **24 Claims**



5. The disk file of claim 3 wherein said head-suspension means comprises a relatively thin and flexible metallic member operable to compliantly support said transducing head relative to the recording surface of said disk, and wherein said actuator-arm means comprises a relatively thick and rigid metallic member operable to noncompliantly support said subassembly.

4,943,876

MAGNETIC HEAD POSITIONING APPARATUS FOR FLOPPY DISK DRIVE

Tutomu Kawahara, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 126,230, Nov. 27, 1987, abandoned. This application Nov. 2, 1989, Ser. No. 430,930

Claims priority, application Japan, Nov. 29, 1986, 61-284558

Int. Cl.[5] G11B *5/55*

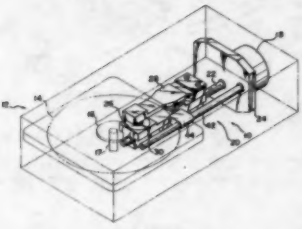
U.S. Cl. 360—106 **3 Claims**

1. A magnetic head positioning apparatus for floppy disk drives for moving a first magnetic head along a destination track of a floppy disk which is supported and rotated by a drive

shaft, said first magnetic head being moved in a radial direction of the floppy disk, and said drive shaft extending from a base of the floppy disk drive coaxial with an axis of rotation of the floppy disk, said apparatus comprising:

a carriage including a carriage body which as a central axis extending in parallel to a surface of the floppy disk, and a carriage arm opposed to the carriage body and having a central axis, said first magnetic head being fixed to the carriage body;

a lead screw engaging the carriage and having an axis parallel to the central axis of the carriage body, said axis of the lead screw being located in a plane which includes the central axis of the carriage body, the central axis of the



carriage arm, and a center of gravity of the carriage, and which perpendicularly intersects a plane including the surface of the floppy disk, said lead screw having a first end portion located between the base and the floppy disk and close to the drive shaft, and a second end portion located outside of a periphery of the floppy disk;

drive means for rotating the lead screw around the lead screw axis;

conversion means for converting rotation of the lead screw into a linear motion of the carriage along the lead screw axis; and

rotation preventing means for preventing the carriage from rotating around the lead screw axis.

4,943,877

FINE HEAD POSITIONING SYSTEM FOR A TAPE BACKUP DEVICE

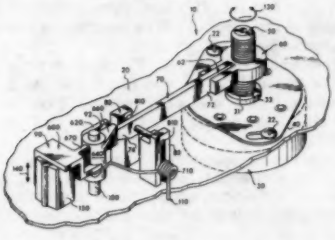
Thomas G. Cannon, Loveland; Bruce D. Roemmich, Fort Collins, and Terry A. Precht, Loveland, all of Colo., assignors to Colorado Memory Systems, Inc., Loveland, Colo.

Continuation of Ser. No. 280,507, Dec. 6, 1988, Pat. No. 4,858,047. This application Jul. 11, 1989, Ser. No. 378,013

The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.

Int. Cl.[5] G11B *5/54*

U.S. Cl. 360—106 **16 Claims**



1. A fine tape head positioning system in a tape cartridge drive back-up system for positioning a magnetic tape head, said system comprising:

an elongated rotating lead screw providing rotational bi-directional movement,

a follower nut threadingly engaging said elongated rotating lead screw,

an elongated lever arm, said elongated lever arm having a first end engaging said follower nut to cause said follower nut to move upwardly or downwardly along said elongated rotating lead screw depending upon the direction said elongated rotating lead screw rotates and whereby said first end of said elongated lever arm moves upwardly and downwardly as said follower nut moves upwardly and downwardly,

means connected to said elongated lever arm for pivoting said elongated lever arm at a first predetermined distance from said first end,

a head mounting assembly, said head mounting assembly comprising:

(a) said magnetic tape head being mounted to a first portion of said head mounting assembly, and

the second end of said elongated lever arm engaging a second portion of said head mounting assembly at a second predetermined distance from said pivoting means,

means oriented in the same direction as and parallel to said elongated rotating lead screw and engaging said head mounting assembly for slidably engaging said mounting assembly, so that as said elongated rotating lead screw rotates to move said first end of said elongated lever arm upwardly said second end of said elongated lever arm moves said mounting assembly downwardly along said engaging means, and so that as said elongated rotating lead screw rotates to move said first end of said elongated lever arm downwardly said second end of said elongated lever arm moves said mounting assembly upwardly along said engaging means and said engaging means and said pivoting means operating on said elongated lever arm so as to maintain said follower nut in a fixed relationship to said elongated lever arm, and

means abutting said head mounting assembly for biasing said head assembly in a direction which causes said first end of said elongated lever arm to firmly engage said follower nut so that as said follower nut moves upwardly and downwardly along said lead screw, said elongated lever arm pivots about said pivoting means to correspondingly move downwardly and upwardly along said engaging means.

4,943,878

ULTRA-COMPACT RECORDER

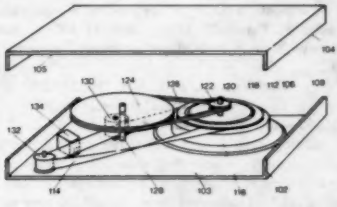
Yong-En Lin, 64-41 Saunder St., #610, Rego Park, N.Y. 11374

Continuation-in-part of Ser. No. 166,561, Mar. 9, 1988. This application Feb. 28, 1989, Ser. No. 314,775

Claims priority, application China, Jun. 16, 1987, 87104137

Int. Cl.[5] G11B *15/26, 23/087*

U.S. Cl. 360—90 **19 Claims**



1. An apparatus for recording and reproducing signals on a tape medium wherein the drive system comprises a tape reel with a central aperture, a flat disc shaped motor mounted coaxially within the central aperture of the tape reel.

4,943,879

THIN FILM MAGNETIC HEAD INCLUDING MAGNETIC LAYERS HAVING HIGH SATURATION MAGNETIC FLUX DENSITY AND METAL FILM FOR AVOIDING DETERIORATION DURING MANUFACTURING

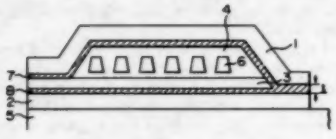
Hisashi Takano, Kokubunji; Yoshihiro Hamakawa, Koganei; Kazuo Shiiki, Kanagawa; Shigekazu Otomo, Sayama, and Noriyuki Kumasaka, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 17, 1987, Ser. No. 85,719

Claims priority, application Japan, Aug. 22, 1986, 61-195383; Jan. 14, 1987, 62-4820

Int. Cl.[5] G11B *5/147*

U.S. Cl. 360—126 **17 Claims**



1. A thin film magnetic head having a head gap end and a back end comprising:

first and second magnetic layers magnetically coupled at said back end of the magnetic head to form a magnetic core, each of said magnetic layers being of a material having a saturation magnetic flux density greater than that of a Ni-Fe alloy, said second magnetic layer being supported by a base layer;

a non-magnetic material layer interposed between said first and second magnetic layers for forming a gap of the magnetic head at said head gap end;

an electrically insulating layer made of an organic material provided between said first magnetic layer and said non-magnetic layer so that turns of coil wound about said magnetic core are partly formed in electrically insulated relation within said electrically insulating layer; and

a metal film formed on a portion of said non-magnetic material layer and extending on said electrically insulating layer so that said electrically insulating layer does not contact with said first magnetic layer thereby suppressing reaction between said electrically insulating layer and said first magnetic layer.

4,943,880

DISK LOCKING MECHANISM FOR DISK CARTRIDGE

Robert A. Muehlhausen, May Township, Washington County, and John F. Fairchild, Hugo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

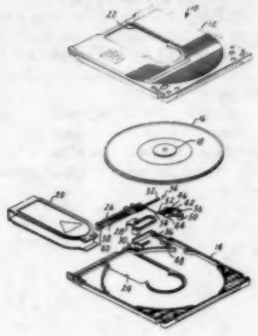
Filed Nov. 14, 1988, Ser. No. 270,359

Int. Cl.[5] G11B *23/03*

U.S. Cl. 360—133 **3 Claims**

1. A locking mechanism for a disc cartridge including a housing enclosing a recording disc for rotation within said housing and shutter means movable between a closed position preventing access to the disc through said housing and an open position providing access to the disc through the housing, said locking mechanism comprising:

a locking lever pivotally mounted to said housing and having a first end for contact with said disc and a second end disposed opposite the pivotal mounting of said locking lever for contact with said shutter means when said shutter means is in said closed position so that said first end of said locking lever is forced into contact with said disc when said shutter means is in said closed position.



4,943,881

HEAD SUPPORTING STRUCTURE IN DISK DRIVE SYSTEM FOR DOUBLE SIDED FLEXIBLE DISK

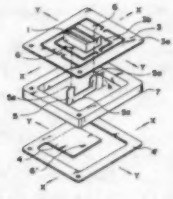
Shin Isozaki, Kamakura, and Michio Yagi, Hachioji, both of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,224

Claims priority, application Japan, Jul. 29, 1987, 62-187834

Int. Cl.[5] G11B *5/48*

U.S. Cl. 360—104 **7 Claims**



1. A supporting structure for a dual magnetic head for use with a disk drive system for a double sided flexible disk (10) having:

a. a first magnetic core head (1') and a second magnetic core head (1), said first head (1') being disposed on a first side (1'') of said flexible disk (10) and said second head (1) being disposed on a second side (0'') of said flexible disk (10), said first side (1'') comprising a first data storage surface and said second side (0'') comprising a second data storage surface;

b. a first leaf spring gimbal (3') for supporting said first magnetic core head (1') said first leaf spring gimbal (3') allowing said first magnetic core head (1') to pitch and to roll as well as to move normally to said first data storage surface;

c. a second leaf spring gimbal (3) for supporting said second magnetic core head (1), said second leaf spring gimbal (3) allowing said second magnetic core head (1) to pitch and to move normally to said second data storage surface (0''), and

d. a cantilever leaf spring (4) connected to said second leaf spring gimbal (3), said cantilever leaf spring (4) preventing rolling of said second magnetic core head (1),

wherein a first end of said cantilever leaf spring is fixed at

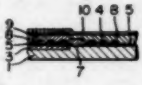
places placed apart in a radial direction with respect to said disk (**10**), said cantilever leaf spring provided with a second end, remote from said first end, slidably connected to a central portion (*3b*) of said second leaf spring gimbal (**3**) to form slidable joints.

4,943,882

THIN-FILM, PERPENDICULAR MAGNETIC RECORDING AND REPRODUCING HEAD

Toshiaki Wada, and Akio Murata, both of Mishima-gun, Japan

Continuation-in-part of Ser. No. 42,250, Apr. 24, 1987, abandoned. This application Dec. 23, 1988, Ser. No. 289,422
Claims priority, application Japan, Feb. 9, 1987, 62-28695
Int. Cl.[5] G11B *5/147*
U.S. Cl. 360—126 **18 Claims**



1. A thin-film, perpendicular magnetic recording and reproducing head comprising:

a magnetic substrate which has a mechanochemically polished principal surface, said magnetic substrate being formed of a magnetic material having a principal surface and a nonmagnetic material located in a plurality of grooves in said principal surface;

a thin-film conductor coil located on said polished principal surface of said magnetic substrate;

a first insulating layer of an inorganic oxide covering said magnetic substrate and said conductor coil, said first insulating layer having a thickness of 0.3 to 3.0 μm and including a via hole formed therein which extends to said principal surface of said magnetic substrate and exposes a surface portion thereof;

a first main pole located on the surface of said first insulating layer and said exposed surface portion of said magnetic substrate;

a second insulating layer of an inorganic oxide covering said first main pole and said first insulating layer and being polished to flatten the surface of said second insulating layer to remove its uneveness and leave an exposed finely polished surface portion of said first main pole;

a flat second main pole provided on said finely polished exposed surface portion of said first main pole and polished surface of said second insulating layer, said second main pole having a small thickness; and

a protective overcoat covering said second main pole and said second insulating layer;

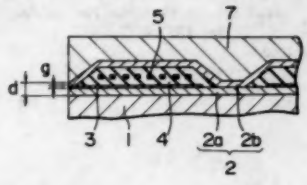
an exposed end face of the thin-film magnetic head opposite a magnetic recording medium being composed of the magnetic substrate, the nonmagnetic material in the grooves in said magnetic substrate, the first insulating layer which covers the conductor coil, the second insulating layer, the second main pole and the protective overcoat.

4,943,883

QUARTERNARY AMORPHOUS MAGNETIC ALLOY THIN FILM AND MAGNETIC HEAD INCLUDING SAME

Masaaki Sano; Takao Imagawa; Kouichi Nishioka, all of Hitachi; Shinji Narishige; Masanobu Hanazono, both of Mito; Takashi Onishi, Hiratsuka, and Toshihiro Yoshida, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 2, 1988, Ser. No. 266,080
Claims priority, application Japan, Nov. 9, 1987, 62-282850
Int. Cl.[5] G11B *5/147*
U.S. Cl. 360—126 **12 Claims**



1. A thin film magnetic head comprising:

a first and a second thin film made of a magnetic material, disposed so as to form a closed magnetic circuit; and

an intermediate film made of a non-magnetic material, disposed between said first and said second thin films so as to form a magnetic gap at a part of said magnetic circuit;

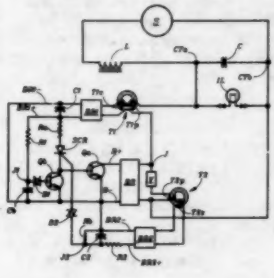
wherein at least one of said first and said second thin films is made of a quaternary amorphous magnetic alloy, whose principal component is cobalt and which contains hafnium, tantalum and palladium.

4,943,884

SERIES-EXCITED PARALLEL-LOADED RESONANT CIRCUIT

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Jan. 23, 1985, Ser. No. 693,880
The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.
Int. Cl.[5] H02H *3/12*
U.S. Cl. 361—15 **13 Claims**



1. An arrangement operable to power a load from a source of AC voltage, comprising:

an L-C circuit operable to be series-connected across said source, said L-C circuit being resonant at or near the frequency of said AC voltage and having a tank-inductor and a tank-capacitor;

connect means operable to connect said load in parallel-circuit with said tank-capacitor;

voltage-limiting means connected in parallel-circuit with said tank-capacitor, said voltage-limiting means being operative to conduct current, but only when said load is

inoperative to keep the magnitude of the voltage across said tank-capacitor below a certain level; and

control means operative to substantially cause a short circuit to be applied across the tank-capacitor in case current flows through said voltage-limiting means for more than a brief period.

4,943,885

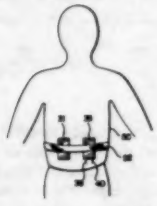
REMOTELY ACTIVATED, NONOBVIOUS PRISONER CONTROL APPARATUS

Brian D. Willoughby, 7407 Berkshire Dr., Clinton, Md. 20735, and Carl W. Roy, II, 9655 Ridgeview Dr., Owings, Md. 20736

Filed Feb. 16, 1988, Ser. No. 155,736

Int. Cl.[5] H01T *23/00*

U.S. Cl. 361—232 **5 Claims**



1. Apparatus for control of a dangerous prisoner to prevent unpredictable dangerous actions by said dangerous prisoner while in social context situations while nevertheless concealing such apparatus from public view, comprising:

incapacitant delivery means,

torso mounting means comprising a belt of sufficient extent to encircle a prisoner's torso and means for securing said incapacitant delivery means in contact with said prisoner's torso,

said mounting means being adapted for concealment beneath garments ordinarily worn by ordinary persons in said social context to prevent said prisoner from being marked by observers in said social context as a person under restraint,

said incapacitant delivery means being powered to deliver an incapacitating electrical shock to said prisoner,

said mounting means further including means for receiving a remotely activated signal, and

means in said mounting means responsive to said signal for delivering said incapacitating electrical shock to said prisoner.

4,943,886

CIRCUITRY FOR LIMITING CURRENT BETWEEN POWER INVERTER OUTPUT TERMINALS AND GROUND

Fazle S. Quazi, Boulder, Colo., assignor to Etta Industries, Inc., Boulder, Colo.

Filed Feb. 10, 1989, Ser. No. 308,515

Int. Cl.[5] H05B *41/29*

U.S. Cl. 361—42 **17 Claims**

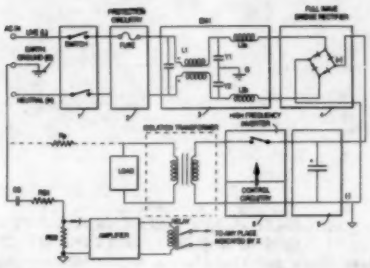
1. Circuitry for limiting a high frequency current through a load comprising:

a DC voltage source having at least two output terminals where the DC voltage occurs at a first of the terminals and the second of the output terminals is connected to a circuit ground;

inverter means for converting the DC voltage to said high frequency current, the inverter means having at least two output terminals where one of said output terminals is connected to said circuit ground;

a chassis containing said voltage source and said inverter means where the chassis is connected to an earth ground and where said earth ground and said circuit ground are at different electric potentials;

sensing means connected between said earth ground and one of said two output terminals of the voltage source to establish a current path from the earth ground to said one output terminal of the voltage source to thus monitor any



high frequency current which may flow through a resistance connected between one of the output terminals of the inverter means and said earth ground; and

limiting means responsive to said sensing means for limiting the high frequency current through the resistance in response to the current through the resistance exceeding a predetermined limit.

4,943,887

FREQUENCY-DEPENDENT OVERVOLTAGE PROTECTIVE DEVICE FOR HIGH VOLTAGE APPLIANCES

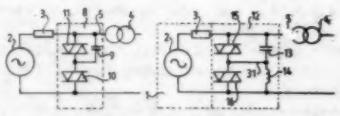
Ajit K. Bose, Nijmegen, Netherlands, assignor to Smit Transformation B.V.

Filed May 20, 1988, Ser. No. 196,564

Claims priority, application Netherlands, May 22, 1987, 8701238

Int. Cl.[5] H02H *9/04*

U.S. Cl. 361—56 **20 Claims**



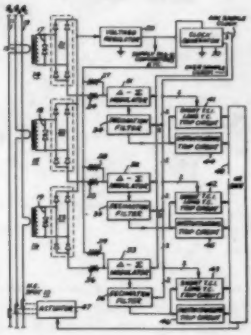
1. Apparatus for protecting an electrical appliance against supply overvoltage and against internal resonance overvoltage phenomena which comprises an asymmetrical impedance/-capacitive electrical circuit which comprises a first conductor extending from a supply voltage network and the electrical appliance and a second conductor extending from the electrical appliance back to the supply voltage network, a series connection of two voltage-dependent impedance means connected across the first and second conductors for establishing a safety voltage level to protect the electrical appliance against said supply overvoltage and defining a junction between such two voltage-dependent impedance means, and capacitor means connected in parallel with only one of said voltage-dependent impedance means for protecting, in conjunction with the other of said voltage-dependent impedance means, against said internal resonance overvoltage phenomena.

4,943,888

ELECTRONIC CIRCUIT BREAKER USING DIGITAL CIRCUITRY HAVING INSTANTANEOUS TRIP CAPABILITY

Philippe L. Jacob; Sharbel E. Noujaim, both of Clifton Park; Glenn A. Forman, Schenectady, all of N.Y., and John A. Mallick, Bridgeport, Conn., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 10, 1989, Ser. No. 377,373
Int. Cl.[5] H02H 2/08
U.S. Cl. 361—96 18 Claims



11. An electronic circuit breaker for an n-conductor power line, n being an integer at least one, said electronic circuit breaker comprising:

respective means for providing an analog indication of the amplitude of current flow in each of the n conductors of said power line;

a respective delta-sigma modulator of the oversampled type for converting each of said analog indications into a respective succession of bits indicative of the amplitude of current flow in each of the n conductors in said power line;

means, responding to said successions of bits indicative of the amplitudes of current flow in each of the n conductors in said power line being indicative that any of said current flows is excessive, for generating an actuating signal; and

means responsive to said actuating signal for interrupting conduction through said n-conductor line.

4,943,889

ELECTROSTATIC CAPACITOR TYPE SENSING DEVICE

Naoyuki Ohmatoi, 10-12, 2-chome, Kugenuma, Matsugaoka, Fujisawa-shi, Kanag[illegible]ken, Japan

Continuation-in-part of Ser. No. 201,786, Jun. 3, 1988, abandoned. This application Aug. 18, 1989, Ser. No. 396,248
Claims priority, application Japan, Jul. 3, 1989, 1-171731
Int. Cl.[5] H01G 7/00
U.S. Cl. 361—284 6 Claims

1. An electrostatic capacitance type sensing device comprising:

a first electrode to be placed in the proximity of an object to be measured;

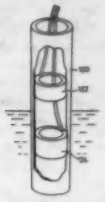
a second electrode placed in the proximity of said first electrode;

a film like dielectric spacer means interposed between said first and said second electrodes;

a first resistor, one end of which is connected to one end of said first electrode;

a second resistor, one end of which is connected to one end of said second electrode;

an a.c. signal generator connected to the other ends of said first and the second resistors and to the ground; and



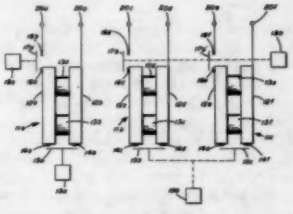
a phase difference detecting means connected to said first and the second electrodes.

4,943,890

SOLID STATE MOTOR STARTER

Robert W. Schaltenbrand; Brian Semaa, both of Allison Park, and Donald Shepherd, Saxonburg, all of Pa., assignors to Benshaw, Inc., Glenshaw, Pa.

Filed Jul. 19, 1989, Ser. No. 382,727
Int. Cl.[5] H05K 7/20
U.S. Cl. 361—388 42 Claims



1. A starter control assembly comprising:

at least two electrically conducting heat sink members in spaced relation from each other;

at least one solid state control device being physically and electrically connected intermediate said heat sink members;

at least one of said heat sink members being a line heat sink;

connector means for receiving a source of electrical power;

at least one of said heat sink members being a load heat sink having means for delivering electrical power to a load;

at least one stationary contact mounted on one of said heat sinks; and

at least one movable contact means selectively engaging said stationary contact and establishing electrical current path between at least one of a shunting path between said line and load heat sinks, and an incoming path between said connector means and said line heat sink.

4,943,891

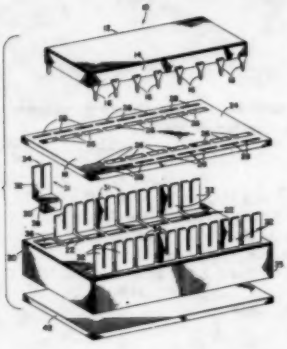
MICROELEMENT AND BASE ASSEMBLY

Alan Ouellette, 17 Graham Rd., East Hartford, Conn. 06118

Continuation-in-part of Ser. No. 252,032, Sep. 28, 1988, abandoned, and a continuation-in-part of Ser. No. 122,505, Dec. 17, 1985, abandoned. This application Jul. 11, 1989, Ser. No. 378,409
Int. Cl.[5] H05K 7/00
U.S. Cl. 361—392 8 Claims

1. An assembly comprising an electronic circuit microelement having a body of insulating material which houses active circuit elements and also having a plurality of similar electrically conductive terminals which extend from opposite sides of

the body, each of said terminals being bent so that the terminals project in two spaced apart parallel series in the same direction, and each terminal having a free end portion adapted to make electrical contact, a base for mounting the microelement for selective external electrical connection and for electrical interconnection of its terminals, said base being of insulating material and having two spaced apart parallel series of upwardly open recesses its top surface, an associated plurality of electrically conductive connectors each with a free end portion projecting upwardly from the top surface of the base and



with a lower end portion, said lower end portion being received respectively in an upwardly open recess in the base, the bottom surface of said base being substantially flat and continuous, and said connectors being engageable in electrically conductive contact respectively with said free end portions of said terminals when the microelement is positioned on said top surface of the base with the terminals projecting downwardly into said recesses in the base, and said upwardly projecting free end portions of said connectors being of sufficient length as to be readily accessible for electrical connection above the top surface of the microelement mounted on the base.

4,943,892

SOLID ELECTROLYTIC CAPACITOR AND METHOD FOR MANUFACTURING THE SAME

Sohji Tsuchiya, Kanagawa; Yasuo Kudoh, Yokohama; Toshikuni Kojima, Kawasaki; Masao Fukuyama, and Susumu Yoshimura, both of Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 31, 1989, Ser. No. 331,204

Claims priority, application Japan, Mar. 31, 1988, 63-80770; Jun. 9, 1988, 63-142136; Jun. 9, 1988, 63-142137; Sep. 9, 1988, 63-227022; Feb. 20, 1989, 1-39910

Int. Cl.[5] H01G 9/00; B01J 17/00

U.S. Cl. 361—525 **25 Claims**

1. A solid electrolytic capacitor which comprises a capacitor element including a valve metal member capable of forming a dielectric oxide film thereon, a dielectric oxide film formed on the valve metal member, a manganese dioxide layer formed on the dielectric oxide film, a conductive polymer film formed on the manganese dioxide layer by electrolytic polymerization, and terminals formed on the valve metal member and the conductive polymer film, respectively.

4,943,893

AUTOMOTIVE ILLUMINATION SYSTEM

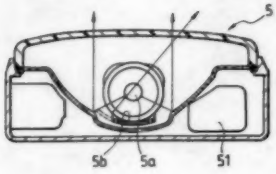
Hiroki Shibata; Kazuki Takahashi; Keiichi Tajima; Takashi Kurita; Kiyoshi Wada, and Kiyoshi Yamashita, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1988, Ser. No. 245,188

Claims priority, application Japan, Sep. 16, 1987, 62-229874

Int. Cl.[5] B60Q 1/12

U.S. Cl. 362—37 **8 Claims**



1. An illumination system for a vehicle, comprising: four headlamps provided on a front portion of said vehicle, two of said headlamps producing illuminating beams having a direction of illumination fixed in substantially the same as the straight-ahead direction of said vehicle, and the other two of said headlamps each comprising a bulb, a fixed main reflector having a pair of main reflecting surfaces, a rotatable auxiliary reflector, and means for continuously changing a rotational position of said rotatable reflector in conjunction with the steering of said vehicle, said rotatable reflector being positioned behind said bulb between main reflecting surfaces of said main reflector, said rotatable reflector having a range of rotation outside a light path between said bulb and said main reflecting surfaces so that an illumination pattern in said straight ahead direction produced by said main reflecting surfaces is substantially unaffected by rotation of said auxiliary reflector.

4,943,894

PROJECTOR-TYPE HEAD LAMP FOR VEHICLES

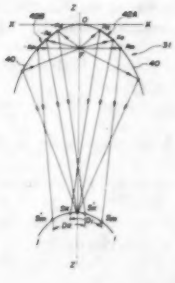
Yutaka Nakata, Isehara, Japan, assignor to Ichikoh Industries, Ltd., Tokyo, Japan

Filed Jun. 14, 1989, Ser. No. 365,574

Claims priority, application Japan, Jun. 14, 1988, 63-144676

Int. Cl.[5] B60Q 1/00

U.S. Cl. 362—61 **7 Claims**



1. A projector-type head lamp for vehicles, comprising a

reflector having an optical axis, a lamp bulb operable as a light source, having a filament horizontally disposed in a direction perpendicular to said optical axis, a shade having an optically effective cut-off edge which blocks a part of the rays of light emitted from said light source and reflected at said reflector to shape a bright-dark boundary, and a convex lens disposed in an area defined by the light beam shaped by said shade and having a focus near the upper center of the cut-off edge of said shade,

the inner reflecting surface of said reflector having a main reflecting area including a part of a spheroid having a first focus near the center of said filament and a second focus near the center of said cut-off edge, at least parts of said main reflecting area being located above or below the horizontal plane in which said optical axis lies and which define multiple largely slanted filament images on the screen being formed as sub reflecting areas having such reflecting characteristics as to shift said filament images horizontally.

4,943,895

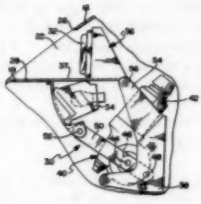
RETRACTABLE HEADLAMP ASSEMBLY

Darrell L. Brandenburg, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 24, 1989, Ser. No. 342,206

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 362—66 **3 Claims**



1. In combination with a motor vehicle the front end of which is provided with an opening for a lamp, a support housing mounted to the rear of said opening for pivotal movement about a horizontal axis, a first lamp for projecting a beam of high intensity light forwardly of the vehicle mounted on said support housing, a second lamp for projecting a beam of low intensity light forwardly of the vehicle mounted on said support housing, and actuator means carried by the vehicle and connected to said support housing for selectively pivoting said support housing about said horizontal axis between a first position wherein said first lamp is located in said opening and the second lamp is concealed by a first portion of said front end of the vehicle and a second position wherein said second lamp is located in said opening and said first lamp is concealed by a second portion of said front end of the vehicle.

4,943,896

PRODUCTION OF IMPROVED INFANT CARE ARTICLES

Tony Johnson, Rte. 4, Box 4471, Bullard, Tex. 75757

Filed Nov. 21, 1988, Ser. No. 273,904

Int. Cl.[5] F21V *9/16*

U.S. Cl. 362—84 **19 Claims**

1. A process for producing infant care articles having one or more components formed of a plastic material by molding or extrusion, so that at least one of such components has the property of phosphorescent emission of light radiation visible to the human eye in a darkened environment, comprising the steps of

selecting a non-toxic, non-irritating phosphorescent pigment material for addition to the plastic material from which one or more components of the infant care article is to be formed, such phosphorescent pigment material having a thermal decomposition point above the melting point of the plastic material and not being subject to chemical degradation by the plastic material;

then mixing a predetermined quantity of said phosphorescent pigment material with a predetermined quantity of said plastic material in a ratio selected to provide the desired intensity of phosphorescently emitted light;

then forming one or more components of the infant care article to be produced from said plastic material containing said phosphorescent pigment material by molding or extrusion;

then forming a transparent coating, of a non-toxic nonphosphorescent material, on the surface of said one or more components of the infant care article produced from said plastic material containing said phosphorescent pigment material, so as to provide a barrier between the phosphorescent pigment material and the user of the infant care article and prevent direct contact with said phosphorescent pigment material;

forming any remaining components of the infant care article to be produced; and

then assembling all components of the infant care article to produce the finished article with one or more components having the property of phosphorescent emission of visible light.

4,943,897

ASSEMBLY OF A LIGHT HOUSING AND AN ELECTRIC LAMP

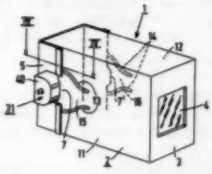
Johannes A. A. M. Van Heeswijk, and Henricus M. C. Van Gestel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 7, 1989, Ser. No. 377,366

Claims priority, application Netherlands, Dec. 23, 1988, 8803150

Int. Cl.[5] F21S *3/00*

U.S. Cl. 362—223 **30 Claims**



1. An assembly of a light housing and an electric lamp comprising

a light housing (1) provided with walls (3, 5, 11, 12) and a light-emanating window (4),

a resilient holding device (7, 7', 8) for an electric lamp (31), which holding device has a first holding member (7, 7') with contact regions (9) formed on the limbs of a V and a second holding member (8) facing the first member and cooperating therewith,

an electric lamp (31) provided with

a lamp vessel (32) having a longitudinal direction (33) and two ends (34, 35) sealed in a vacuum-tight manner,

a light source (36) in the lamp vessel extending in the longitudinal direction (33) of the lamp vessel (32),

current supply conductors (37) extending through a respective end (34, 35) of the lamp vessel (32) to the light source (36),

the ends (34, 35) of the lamp vessel (32) being fixed in a first (40) and a second lamp cap (41), respectively, whose surface is cylindrically curved about an axis (43) extending substantially in the longitudinal direction (33) of the lamp vessel (32) and provided with an electric contact member (44, 45), to which the current supply conductor (37) is connected,

characterized in that

the first holding member (7, 7') is rigidly connected to the light housing (1) and is subdivided, a first part (7) with contact regions (9) formed on the limbs of a V engaging a cylindrically curved surface (42) of a first lamp cap (40) and a second part (7') of similar shape engaging a cylindrically curved surface (42) of the second lamp cap (41) of the electric lamp (31),

the lamp vessel (32) of the electric lamp (31) is fixed with its ends (34, 35) in a respective lamp cap (40, 41), the light source (36) being aligned with respect to the first holding member (7, 7'), and

means are provided by which rotation of the lamp vessel (32) about its longitudinal direction is limited.

4,943,898

ELECTRIC LAMP HAVING A LAMP CAP OF SYNTHETIC MATERIAL

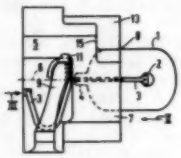
Leon P. Weenink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 26, 1988, Ser. No. 263,100

Claims priority, application Netherlands, Nov. 20, 1987, 8702780

Int. Cl.[5] H01R *33/00*

U.S. Cl. 362—226 **9 Claims**



1. An electric lamp assembly, comprising:

an electric lamp, said electric lamp comprising a translucent lamp vessel, an electric element disposed in the lamp vessel, and current conductors extending from the electric element through a first end of the lamp vessel to the exterior; and

a lamp cap of synthetic material, said lamp cap comprising a sleeve-shaped portion defining a longitudinal axis and having an opening for receiving said first end of said lamp vessel,

a pair of elongate cantilevered tongues, said tongues extending freely in the circumferential and longitudinal direction of said sleeve-shaped portion, each tongue having a first contact surface resiliently displaceable in the longitudinal direction, and

a pair of projections extending from said sleeve-shaped portion each with a second contact surface transverse to the longitudinal axis, said second contact surfaces facing said first contact surfaces and being longitudinally spaced at a predetermined distance therefrom,

the first end of the lamp vessel being secured in said lamp cap opening and the current conductors extending over a respective one of said first contact surfaces or said second contact surfaces.

4,943,899

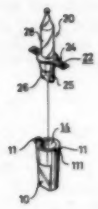
SOCKET AND BULB SNAP FASTENER FOR CHRISTMAS LIGHT STRINGS

Jeou N. Tseng, No. 17, Alley 53, Lane 167, Tung Nan St., Hsin Chu City, Taiwan

Filed Dec. 6, 1989, Ser. No. 446,936

Int. Cl.[5] H01R *33/00*

U.S. Cl. 362—226 **2 Claims**



1. A socket and bulb snap fastener for Christmas light strings, comprising a socket and a bulb, said bulb comprising a lighting element and an insert having two leads mounted thereon which are electrically connected to said lighting element, a hole being centrally formed on said socket for receiving said insert, said socket and bulb snap fastener being characterized in that said socket and bulb snap fastener further comprises:

at least one T-shaped male member having a snapping head being formed on an upper margin of a periphery of said socket;

a corresponding number of tongues of insulating material being formed, relative to each said T-shaped male member, in the vicinity of an upper margin of said insert, a substantially rectangular slot having a width slightly less than a maximum width of said snapping head of said T-shaped male member being formed on each said tongue adjacent to a free end of each said tongue, a V-shaped groove being formed on a lower side of each said tongue at an end opposite to said free end and extending transversely to a length of each said tongue, each said slot being engageable with each corresponding said T-shaped male member by bending said tongue downwardly about said V-shaped groove and pushing each said tongue against each corresponding said T-shaped male member such that each respective said snapping head is forced through each corresponding said slot.

4,943,900

LIGHTING FIXTURE

Klaus Gärtner, Karl-Marx-Str. 80, D-1000 Berlin 44, Fed. Rep. of Germany

Filed Aug. 9, 1988, Ser. No. 229,949

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1987, 8711021

Int. Cl.[5] F21S *3/00*

U.S. Cl. 362—227 **10 Claims**

1. A lighting fixture comprising:

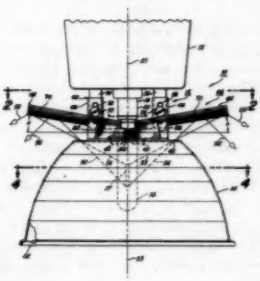
(a) two opposing holding heads;
(b) a female electrical connector disposed in the interior of each of the holding heads, the holding heads being positioned such that said female connectors face one another;
(c) a rigid lighting tube containing a plurality of series-connected miniature light bulbs, said lighting tube being disposed between said respective holding heads;
(d) a male electrical connector disposed on respective terminal ends of said lighting tube, each of said male connectors being electrically connected to one of said female connectors; and
(e) a profiled connecting member having an arc-shaped cross-section and a gap, said profiled connecting member being disposed on each of said respective holding heads in a form-locking manner coaxially on the lighting tube, the profiled connecting member being rotatable about said lighting tube relative to said holding heads, whereby light only emits from the lighting fixture through the gap in the profiled connection member and the rotation of the profiled connection member controls the angle of illumination from the lighting fixture.

4,943,901

LUMINAIRE WITH AUXILIARY REFLECTING MEANS

Samuel L. Baldwin, E. Flat Rock, and Mitchell M. Osteen, Zirconia, both of N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 11, 1989, Ser. No. 378,348
Int. Cl.[5] F21V 7/02
U.S. Cl. 362—277 **24 Claims**



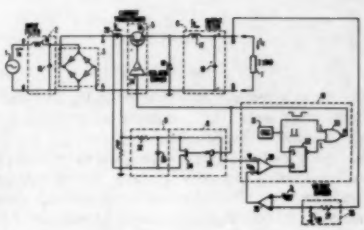
1. A luminaire comprising:
A generally dome-shaped main reflector having a wall extending about an axis and defining a bottom opening and a top opening in said main reflector that are located on said axis,
a lamp within said main reflector extending substantially along said axis and defining a light source located in a position between said top and bottom openings,
said main reflector being adapted by support and adjustable means to be positioned relative to said light source, said main reflector being further adapted by said support and adjustable means to be mounted with said axis extending substantially vertically in a location above a warehouse aisle for illuminating stacked material along both edges of the aisle with light passing through said bottom opening, and
auxiliary reflectors positioned above said top opening by said support and adjustable means for receiving light from said source passing through said top opening and for reflecting said latter light to the edges of said aisle onto regions of said stacked material that are poorly illuminated by light passing through said bottom opening
said support and adjustable means serving as means for adjusting the position of said main reflector with respect to said light source while at the same time maintaining the positioning of said auxiliary reflector above said opening, said adjustment of said position of said reflector relative to said light source controlling the photometric distribution along said aisle while at the same time directly affecting the illumination onto regions of said stacked material that are poorly illuminated.

4,943,902

AC TO DC POWER CONVERTER AND METHOD WITH INTEGRATED LINE CURRENT CONTROL FOR IMPROVING POWER FACTOR

Alex J. Severinsky, Silver Spring, Md., assignor to Viteq Corporation, Lanham, Md.

Continuation of Ser. No. 247,626, Sep. 22, 1988, abandoned, which is a continuation of Ser. No. 123,720, Nov. 23, 1987, Pat. No. 4,816,982. This application Sep. 25, 1989, Ser. No. 411,261
Int. Cl.[5] H02M 7/04
U.S. Cl. 363—80 **10 Claims**



1. A power converter for converting alternating line current provided at an input to direct current delivered at an output of the power converter comprising
filtering means for filtering the input alternating line current,
rectifying means responsive to the input current filtering means for rectifying the filtered input line current,
direct current control means, operated at a substantially higher frequency than the frequency of the input alternating line current, for controlling the direct current delivered to the output of the power converter, the direct current control means particularly comprising current switching means for switching the filtered and rectified line current at high frequency and a control circuit for providing a control signal output for controlling the current switching means and an integrating means,
line current sensing means, responsive to an output of the current rectifying means, for sensing the filtered and rectified line current and
the integrating means responsive to the line current sensing means and to the control signal output of the control circuit of the direct current control means for integrating the sensed line current and for providing a first control signal input to the control circuit of the direct current control means.

4,943,903

POWER SUPPLY IN WHICH REGULATION IS ACHIEVED BY PROCESSING A SMALL PORTION OF APPLIED POWER THROUGH A SWITCHING REGULATOR

Gilbert I. Cardwell, Jr., 27601 Eastvale Rd., Palos Verdes Peninsula, Calif. 90274

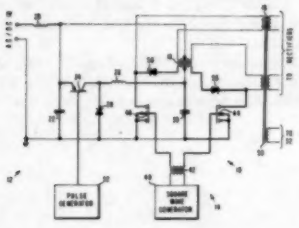
Filed Mar. 14, 1989, Ser. No. 322,836
Int. Cl.[5] H02M 3/337
U.S. Cl. 363—97 **16 Claims**

1. Voltage regulation means for generating a regulated output by processing a small portion of an applied unregulated input voltage through a switching regulator, said voltage regulation means comprising:

first transformer means for providing a regulated output voltage from the voltage regulation means;

second transformer means coupled to the first transformer means for coupling a regulating voltage to the first transformer means that regulates the output voltage;

switch means coupled to the unregulated input voltage source and to the second transformer means for coupling the unregulated portion of the input voltage to the second transformer means;



square wave inverter means coupled to the first and second transformer means for providing an alternating current square wave voltage thereto; and

pulse width modulation means coupled to the switch means for modulating the duty cycle of the switch means to modulate the voltage applied to the second transformer means, and hence regulate the output voltage of the voltage regulation means.

4,943,904

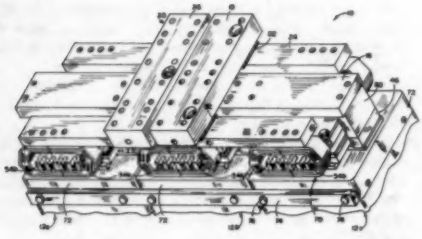
D.C. POWER UNIT ASSEMBLY INCLUDING UNITIZED SINGLE-PHASE D.C. POWER UNITS

Stanley R. Van Antwerp, Hudsonville, and Mark B. Siehling, Allendale, both of Mich., assignors to Conrac Corporation, Hudsonville, Mich.

Filed Jan. 24, 1989, Ser. No. 301,311

Int. Cl.[5] H02M *1/00*; B23K *11/24*

U.S. Cl. 363—144 **16 Claims**



1. A D.C. power unit assembly comprising:

a plurality of D.C. power units each including a rectified pad having first and second opposite ends, said first ends being generally linearly aligned with one another, said second ends being generally linearly aligned with one another, each D.C. power unit further having a common terminal:

a first elongated rectified bus aligned with said first pad ends;

a second elongated rectified bus aligned with said second pad ends;

an elongated common bus directly between said first and second rectified buses and equidistant from each of said first and second rectified buses at any point along said common bus, whereby said common bus is coaxial with said two rectified buses together;

first means for interconnecting said first pad ends to said first rectified bus;

second means for interconnecting said second pad ends to said second rectified bus; and

third means for connecting said common terminals to said common bus.

4,943,905

INTERFACING METHOD IN A NUMERICAL CONTROL APPARATUS

Takashi Iwagaya, Hachioji, and Tomomi Nakazato, Kawasaki, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

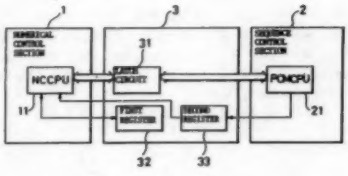
PCT No. PCT/JP88/00178, § 371 Date Aug. 11, 1988, § 102(e) Date Aug. 11, 1988, PCT Pub. No. WO88/06309, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 19, 1988, Ser. No. 245,320

Claims priority, application Japan, Feb. 21, 1987, 62-36888

Int. Cl.[5] G05B *19/18*

U.S. Cl. 364—136 **3 Claims**



1. An interfacing method in a numerical control apparatus, wherein signal transfer between a numerical control section for executing a numerical control program block by block and a programmable sequence control section is effected by means of an interface circuit disposed between these sections, said interfacing method comprising the steps of:

(a) operating said numerical control section so as to deliver a particular command to said interface circuit and to invert a logic level of a first predetermined status signal stored in a first storage means of said interface circuit, when said numerical control section reads said particular command from the numerical control program;

(b) operating said sequence control section so as to invert a logic level of a second predetermined status signal stored in a second storage means of said interface circuit, when said sequence control section completes sequence control associated with said particular command; and

(c) operating said numerical control section so as to start processing associated with a next block of the numerical control program, when a predetermined relation is fulfilled between said first and second predetermined status signals.

4,943,906

DATA SETTING DEVICE FOR AN EMBROIDERING MACHINE

Ikuo Tajima, and Hideo Hasegawa, both of Kasugai, Japan, assignors to Tokai Kogyo Mishin Kabushiki Kaisha, Kasugai, Japan

Filed Jul. 12, 1988, Ser. No. 217,838

Claims priority, application Japan, Jul. 14, 1987, 62-173805; Dec. 23, 1987, 62-323868; Jun. 3, 1988, 63-135642

Int. Cl.[5] D05B *3/02*; G06F *15/46*

U.S. Cl. 364—188 **10 Claims**

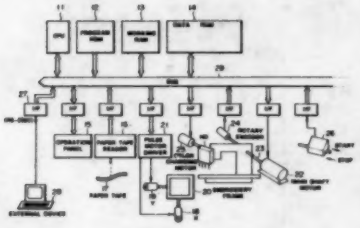
1. A data setting device for an embroidering machine or other sewing machine having a number of functions for setting or selecting various data for specifying an embroidering or sewing operation, comprising:

functions switches of a predetermined number which is

smaller than the number of functions for setting or selecting various data;

switching means for switching a setting or selection function to be assigned to each of the function switches in response to operation thereof, wherein said switching means is one of said function switches;

function assignment means for assigning a predetermined setting or selection function to each of the function switches in accordance with the operation of said switching means;



function display means for displaying, in accordance with the assignment by the function assignment means, a setting or selection function which is currently assigned to each of the function switches; and

means for designating, in response to operation of one of said function switches, a processing corresponding to a setting or selection function which is currently assigned to said one of the function switches.

4,943,907

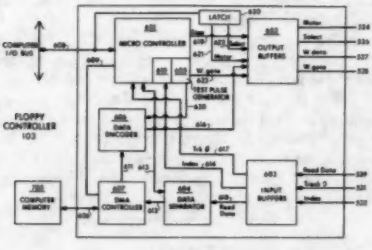
SPEED CONTROLLER FOR RECORDING AND PLAYBACK APPARATUS

Kurt E. Godwin, Loveland, Colo., assignor to Colorado Memory Systems, Inc., Loveland, Colo.

Filed May 8, 1987, Ser. No. 48,022

Int. Cl.[5] G06F *1/00*

U.S. Cl. 364—200 **28 Claims**



1. In a computer controlled data processing system having a controller and a drive operating at any one of a predetermined plurality of different data rates and connected to said controller for exchanging data between said controller and said drive, a method of controlling the operational data rate of said drive to provide data rate compatibility between said drive and said controller, said method comprising the steps of:

transmitting a first command from said computer to said drive for operating said drive to generate a firs signal representing a high operational data rate of said drive,

transmitting said first signal from said drive to said controller,

generating a second signal in said controller in response to the reception of said first signal by said controller with said second signal representing a data rate at which said controller can operate,

operating said controller to compare said first and second signals to determine whether the data rate represented by said first signal exceeds the data rate represented by said second signal,

transmitting an output signal from said controller to said computer in response to said determination indicating whether the data rate represented by said first signal exceeds the data rate represented by said second signal,

transmitting a second command from said computer to said drive to set the operational data rate of said drive at the data rate represented by said first signal if said output signal of said controller indicates that the data rate represented by said first signal does not exceed the data rate represented by said second signal, and

generating an error signal in said controller to select a lower one of said predetermined plurality of data rates of said drive if said output signal indicates that said data rate represented by said first signal exceeds the data rate represented by said second signal.

4,943,908

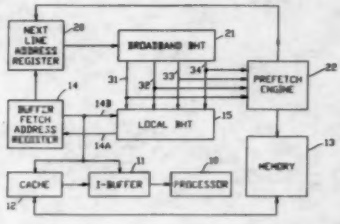
MULTIPLE BRANCH ANALYZER FOR PREFETCHING CACHE LINES

Philip G. Emma, Danbury, Conn.; Joshua W. Knight, III, Mohegan Lake; James H. Pomerene, Chappaqua; Rudolph N. Rechtschaffen, Scarsdale, all of N.Y., and Frank J. Sparacio, North Bergen, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1987, Ser. No. 128,008

Int. Cl.[5] G06F *9/30, 12/12*

U.S. Cl. 364—200 **9 Claims**



1. In a computer with a processor, a main memory, said main memory storing a plurality of lines of instructions, and a cache, said cache temporarily storing instruction lines received from said main memory, apparatus for prefetching instruction lines from said main memory to said cache, comprising:

a branch history table having a plurality of entries, each said entry corresponding to an instruction line in said main memory and comprising addresses of all branches predicted as taken in said corresponding line;

means connected to said branch history table for determining from the branch history table entry for a current instruction line in use by, or in queue for use by, the processor and from an address of an entry point into said current line by the processor, a next instruction line to be used by the processor and an entry point into said next line; and

means responsive to said determination of the next instruction line for prefetching said next line from said main memory into said cache in the event said next line is not already in said cache;

said determining means comprising:

entry register means for receiving and storing initially the entry point address for said current line;

map table means receiving the current address stored in said entry register means and the taken branch addresses from

the branch history table entry for said current line, and outputting

(a) in the event there is no taken branch in said current line following the address stored in said entry register means, the address of the next sequential instruction line in said main memory, and

(b) in the event the taken branch that follows the address stored in said entry register means has a target address in said current line, the address of the next taken branch that will be encountered in said current line after taking said taken branch which follows said stored address, or the address of the next sequential instruction line in said main memory if no other taken branches will be encountered in said current line after taking said taken branch which follows said stored address, and

(c) in the event the taken branch that follows the address stored in said entry register means has a target address outside said current line, said target address; and

means for updating the address stored in said entry register means in the event that said map table means outputs a next taken branch address.

4,943,909

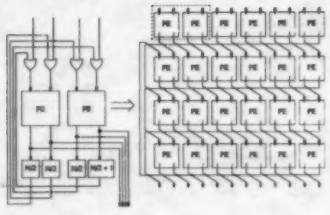
COMPUTATIONAL ORIGAMI

Alan Huang, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 8, 1987, Ser. No. 71,105

Int. Cl.[5] G06F *15/16, 13/00*

U.S. Cl. 364—200 **19 Claims**



9. Processing apparatus comprising a plurality of processing elements arranged in rows and columns characterized in that:

some of said processing elements are main-stream processing elements, at least one of said processing elements is a feedback-supplying processing element, and at least one of said processing elements is a fedback receiving processing element;

each main-stream processing element in a given row and a given column sends output signals to a processing element in a row succeeding said given row and in said given column, and to a processing element in said succeeding row and in a column succeeding said given column;

each feedback-supplying processing element sends output signals to one of said feedback-receiving processing elements in a row preceding the row of said feedback-supplying processing element;

each of said processing elements in a given row and a given column is, at most, connected to one of said processing elements in subsequent row and said column and to one of said processing elements in an adjacent column; and

each of said processing elements performs a selected processing operation independent of the processing operations selected for being performed by other processing elements in said processing apparatus.

4,943,910

MEMORY SYSTEM COMPATIBLE WITH A CONVENTIONAL EXPANDED MEMORY

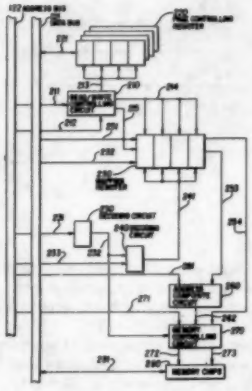
Nobutaka Nakamura, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Apr. 14, 1988, Ser. No. 181,373

Claims priority, application Japan, Apr. 14, 1987, 62-89708; Apr. 14, 1987, 62-89709

Int. Cl.[5] G06F *12/00*

U.S. Cl. 364—200 **3 Claims**



1. An information processing apparatus defining a window in a portion of an address space of a CPU and accessing a memory area, comprising:

a memory section including a plurality of memory blocks, each of the plurality of memory blocks having a set number, each of the memory blocks including a plurality of memory areas, each of the plurality of memory areas having a page number;

a page control means, connected to the CPU, for storing mapping information which is supplied from the CPU and which represents a page number of a memory area in which data is stored;

a mapping register, connected to the CPU and the page control means, for storing mapping information including set information indicating a set number of a memory block in which the data supplied from the CPU is stored; and

a memory control means, connected to the CPU, the page control means, the mapping register and the memory section, for accessing the memory section in accordance with the mapping information stored in the mapping register and the page control means.

4,943,911

SYSTEM FOR LOADING INITIAL PROGRAM LOADER ROUTINE INTO SECONDARY COMPUTER WITHOUT BOOTSTRAP ROM

Dieter Kopp, Hemmingen; Thomas Hörmann, Grossbottwar-WZH, and Uwe Ackermann, Freiberg, all of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Nov. 20, 1987, Ser. No. 123,390

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639571

Int. Cl.[5] G06F *9/24, 9/30, 13/14*

U.S. Cl. 364—200 **1 Claim**

1. Circuit apparatus for executing an initial program loader routine from a secondary computer connected via a shared random-access volatile memory to a primary computer, comprising:

first means for storing the initial program loader routine in the mass memory of the primary computer;

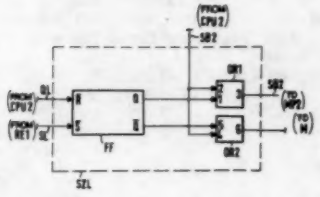
second means for copying the initial program loader routine from said mass memory into said volatile shared memory;

third means for sending a restart instruction from the primary computer to a central processing unit of the secondary computer after the initial program loader has been stored in said volatile shared memory;

fourth means, responsive to said restart instruction, for initially routing all program memory access instructions coming from the central processing unit of the secondary computer to the portion of the shared memory containing the initial program loader routine;

fifth means for sending an acknowledge signal from the central processing unit of the secondary computer when said central processing unit has read the last instruction of the initial program loader routine out of the shared memory;

a control bus linking the secondary computer central processing unit and the secondary computer program memory;



a control line connecting the primary computer to the secondary computer central processing unit for applying said restart instruction;

an acknowledgement line connected to the secondary computer central processing unit for providing said acknowledgement signal; and

memory access logic circuit connected into the control bus at a point intermediate the central processing unit and the program memory, said memory access logic circuit further comprising

a flip flop having a first input connected to said control line, a second input, a noninverting output and an inverting output, and

first and second OR gates each having a pair of inputs and an output, the noninverting output and the inverting output of the flip-flop being respectively coupled to a first input of the first OR gate and to a first input of the second OR gate, the second inputs being connected to the portion of the control bus coming from the secondary computer central processing unit, the first OR gate being connected to the portion of the control bus leading to the program memory, and the output of the second OR gate being connected to the shared memory.

4,943,912

PARALLEL PROCESSOR SYSTEM HAVING CONTROL PROCESSOR AND ARRAY CONTROL APPARATUS FOR SELECTIVELY ACTIVATING DIFFERENT PROCESSORS

Tomoo Aoyama, and Hiroshi Murayama, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Computer Engineering Co., Ltd., Kanagawa, both of, Japan

Filed Oct. 13, 1987, Ser. No. 106,864

Int. Cl.[5] **G06F** *15/16, 9/00*

U.S. Cl. 364—200 **2 Claims**

1. A parallel processing system having a plurality of processor elements comprising:

a main storage;

a processor array control means connected to said main storage for controlling execution of a processing;

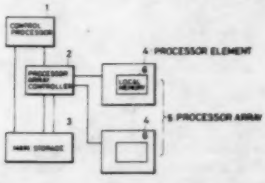
a control processor which is connected to said main storage and to said processor array control means for reading an instruction from said main storage, and for requesting said processor array control means to execute a processing in accordance with a procedure start instruction; and

a plurality of processor elements each including a local memory and wherein each processor element is connected to said processor array control means;

wherein said processor array control means comprises

means for responding to a request from said control processor to transfer a program from said main storage to each of the local memories of said plurality of processor elements,

a plurality of first registers corresponding to said processor elements for holding patterns of tasks, said first registers being reset when corresponding processor elements turn into an idle state, each pattern being relevant to an argument address of a memory area of the main memory used by a task to be performed,



a plurality of comparators corresponding to the first registers for comparing patterns held by the corresponding first registers with a pattern designated by the control processor, wherein when a pattern held by a first register is coincident with said pattern designated by said control processor, the coincident state indicates that an argument address corresponding to the pattern designated by the control processor is being used by a processor element corresponding to said register,

a plurality of second registers corresponding to said processor elements for holding states of said processor elements representing whether the processor elements are busy or not, said second registers being reset when corresponding processor elements turn into an idle state,

means for selecting a processor element that is to be activated based upon a result of said comparison performed by said plurality of comparators and the content of the second registers, and

means for storing said pattern designated by said control processor in a first register corresponding to said selected processor and setting to a busy state a second register corresponding to the selected processor.

4,943,913

OPERATING SYSTEM ACCESSING CONTROL BLOCKS BY USING HOME ADDRESS SPACE SEGMENT TABLE TO CONTROL INSTRUCTION AND OPERAND FETCH AND STORE OPERATIONS

Carl E. Clark, Poughkeepsie, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 10, 1988, Ser. No. 154,780

Int. Cl.[5] **G06F** *9/46, 9/34, 9/44, 12/10*

U.S. Cl. 364—200 **5 Claims**

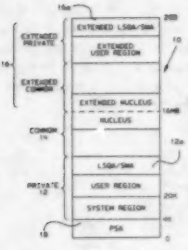
1. In a data processing system having a CPU, a dynamic address translation facility, a system storage including address spaces and an operating system including a dispatcher, said CPU further including a multi-field program status word and a plurality of control registers which store segment table designators containing pointers to segment tables used by said dynamic address translation facility for translating virtual addresses in at least one of said address spaces in said system

storage accessible to said CPU, a method for providing an improved and efficient way for said operating system to access control blocks, instructions and data in a multiple address space environment, said method comprising the steps of:

a. dispatching, via said dispatcher, an address space having the highest priority with a dispatchable unit of work as a home address space which contains control blocks for defining said dispatchable unit of work;

b. loading a pointer to a segment table for said home address space in one of said control registers to provide virtual address translation in said home address space;

c. setting, via a CPU instruction, address space control bits



in a field of said program status word in said CPU thereby identifying a home mode and causing said home address space segment table to be the one to be used by said dynamic address translation facility to translate virtual addresses in said home address space; and then

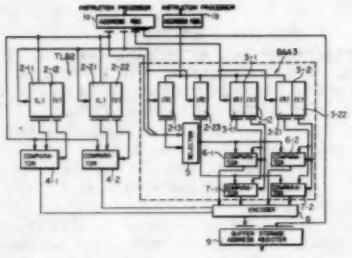
d. accessing said control blocks by said operating system using said home address space segment table to predictably control instruction and operand fetch and store operations from and to said home address space for said dispatchable unit of work in said home address space accessible to said CPU when said program status word in said CPU is set to home mode, without further modification of any other segment table designators.

4,943,914

STORAGE CONTROL SYSTEM IN WHICH REAL ADDRESS PORTION OF TLB IS ON SAME CHIP AS BAA

Kanji Kubo, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1987, Ser. No. 110,425
Claims priority, application Japan, Oct. 20, 1986, 61-247414
Int. Cl.[5] G06F *12/10, 13/00*
U.S. Cl. 364—200 **17 Claims**



1. A storage control system, comprising:

an address translation buffer storing translation pairs of a virtual address and a real address for translating a virtual address into a real address;

a buffer address array storing a real address of data stored in a buffer storage;

register means holding address for accessing the address translation buffer and the buffer address array and for loading an address to be registered into the address translation buffer and the buffer address array;

said address translation buffer being divided into a first part storing virtual addresses and a second part forming a first memory for holding real addresses corresponding to virtual addresses stored in said first part, and said buffer address array forming a second memory for holding said real addresses of data stored in said buffer storage; and

comparator means connected to said first and second memories for comparing an output from said first memory with an output from said second memory;

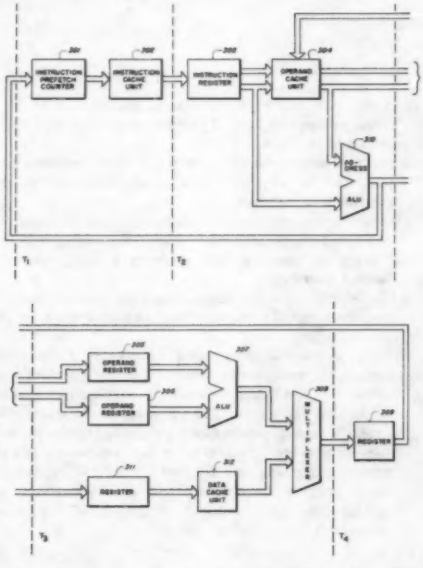
said first memory, second memory and comparator means being formed together in an integrated circuit chip, separate from said first part of said address translation buffer.

4,943,915

APPARATUS AND METHOD FOR SYNCHRONIZATION OF A COPROCESSOR UNIT IN A PIPELINED CENTRAL PROCESSING UNIT

Neil C. Wilhelm, Menlo Park, Calif., and Judson S. Leonard, Waban, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 29, 1987, Ser. No. 101,984
Int. Cl.[5] G06F *15/16*
U.S. Cl. 364—200 **21 Claims**



1. A pipelined central processing unit capable of executing a first set of instructions and a plurality of special instructions, said central processing unit comprising:

an instruction cache memory unit for storing instructions to be executed;

an instruction register for processing an executing instruction from said instruction cache memory unit, said executing instruction being a next instruction to be executed by said central processing unit, said instruction register including means for determining when an executing instruction is a special instruction;

an operand cache memory unit for storing operands to be processed;

at least one operand register for storing an operand to be processed in response to said executing instruction, wherein said operand to be processed is transferred from said operand cache memory unit to said operand register in response to said executing instruction;

an arithmetic logic unit coupled to said instruction register and to said operand register for performing an operation on said operand to be processed in a manner determined by said executing instruction when said executing instruction is selected from said first set of instructions;

a coprocessor unit coupled to said instruction register and to said operand register for performing an operation on said operand to be processed in a manner determined by said executing instruction when said executing instruction is a one of said special instructions;

storage means coupled to said coprocessor unit for storing a resulting operand provided by said coprocessor unit;

first means coupled to said storage means and responsive to a presence of said resulting operand stored in said storage means for applying a first signal to said instruction register; and

second means coupled to said instruction register and responsive to said first signal for preventing processing of an executing instruction when said executing instruction is a special instruction until said first signal is present.

4,943,916

INFORMATION PROCESSING APPARATUS FOR A DATA FLOW COMPUTER

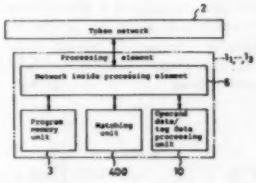
Hajime Asano, Toyonaka; Hiroaki Terada, Suita; Katsuhiko Asada, Amagasaki; Hiroaki Nishikawa, Suita; Masahisa Shimizu, Kadoma; Hiroki Miura, Hirakata; Kenji Shima, Nishinomiya; Shinji Komori, Itami; Souichi Miyata, and Satoshi Matsumoto, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma; Sanyo Electric Co., Ltd., Moriguchi; Mitsubishi Denki Kabushiki Kaisha, Tokyo and Sharp Corporation, Osaka, all of, Japan

Continuation of Ser. No. 868,706, May 30, 1986, abandoned. This application Jun. 1, 1989, Ser. No. 361,701

Claims priority, application Japan, May 31, 1985, 60-119035

Int. Cl.[5] G06F *15/16*

U.S. Cl. 364—200 **19 Claims**



1. In a data flow computer wherein operand data and tag data are carried on tokens flowing in a token network, an information processing apparatus having an input port and an output port comprising:

at least one processing component connected with said token network, wherein tokens each of which has tag data determined according to a predetermined numerical sequence are input in said input port of said information processing apparatus sequentially in time and instructions are executed with respect to said tokens when operand data are in a state of readiness,

said information processing component comprising:

a program memory unit connected with said token network for storing a data flow program including execution instructions embodied therein,

a matching unit connected with said memory unit in which operand data are matched,

an operand data processing unit connected with said matching unit wherein instructions fetched from said program memory are executed using those operand data matched by said matching unit, and

a tag data renewing unit connected to said operand data processing unit for renewing tag data of predecessor tokens having been operated on, to the same values as those of tag data of successor tokens input after those predecessor tokens.

4,943,917

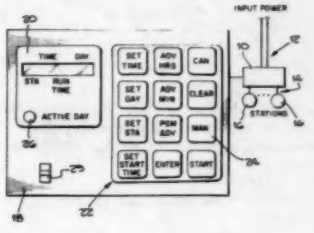
IRRIGATION CONTROLLER HAVING MULTIPLE CANCEL MODES INVOKED BY DEPRESSING SINGLE KEY

John M. Mylne, III, Riverside, Calif., assignor to The Toro Company, Riverside, Calif.

Division of Ser. No. 237,658, Aug. 25, 1988, Pat. No. 4,852,051, which is a continuation of Ser. No. 888,621, Jul. 18, 1986, abandoned, which is a continuation of Ser. No. 581,030, Feb. 17, 1984, abandoned. This application Jul. 10, 1989, Ser. No. 350,450

Int. Cl.[5] G06F *15/56*

U.S. Cl. 364—420 **3 Claims**



1. An improved irrigation controller for individually and automatically controlling water flow to a plurality of individual watering stations in accordance with a programmed watering schedule over a period of days, said controller including a single mechanically-operated key for cancelling all scheduled watering if said key is activated twice while no watering is taking place, for cancelling just the watering scheduled to take place on a particular day, but not the watering scheduled to take place on any subsequent day, if said key is activated once on that particular day while no watering is taking place and, for cancelling just the watering taking place on a particular day, but not the watering scheduled to thereafter take place on that or any subsequent day, if said key is actuated once on that particular day while watering is taking place.

4,943,918

SEISMIC DATA PROCESSING METHOD

Roger A. Young, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 9, 1985, Ser. No. 690,086

Int. Cl.[5] B01V *1/00, 1/20*; G06F *15/20*

U.S. Cl. 364—421 **3 Claims**

1. A method of collecting and processing seismic data with respect to a first layer of the earth and a second layer of the earth having different seismic wave transmission velocity characteristics than said first layer, each layer having an upper boundary and a lower boundary, wherein the first layer overlies the second layer such that each layer has a common boundary, the common boundary being the lower boundary of the first layer and the upper boundary of the second layer, said method comprising the steps of:

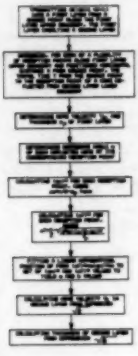
(a) transmitting a plurality of seismic waves into the first layer from a source point located along the first layer upper boundary;

(b) selecting a plurality of reception points along the first layer upper boundary, wherein each reception point is

positioned at a different horizontal distance x from the source point;

(c) measuring, for each reception point, the travel time T from the source point to the reception point of a wave reflected by the second layer lower boundary;

(d) determining the wave velocity V_p and the thickness z_p with respect to the first layer;



(e) determining the emergence angle e of each said reflected wave at its corresponding reception point;

(f) determining a parameter Δx for each reception point, wherein;

$\Delta x = x/2 - z_p \tan e$;

(g) determining a parameter ΔT for each reception point, wherein

$$\Delta T = \frac{T}{2} - \frac{\sqrt{z_p^2 + (x/2 - \Delta x)^2}}{V_p};$$

(h) determining $(\Delta x)^2$ and $(\Delta T)^2$ for each reception point, thereby yielding a set of data pairs, each data pair comprising a $(\Delta x)^2$ value and a $(\Delta T)^2$ pl value; pl (i) fitting a linear mathematical function of the form $(\Delta T)^2 = m(\Delta x)^2 + b$ to said data pairs so as to yield a slope (m) value and an intercept (b) value;

(j) determining the wave velocity V_l in the second layer from the expression

$$\sqrt{\frac{1}{m}};$$

and

(k) determining the thickness of the second layer from the expression

$$\sqrt{\frac{b}{m}}.$$

4,943,919

CENTRAL MAINTENANCE COMPUTER SYSTEM AND FAULT DATA HANDLING METHOD

Matthew J. Aslin, Bothell, and Gary J. Patton, Langley, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 17, 1988, Ser. No. 260,985

Int. Cl.[5] G06F *15/20*

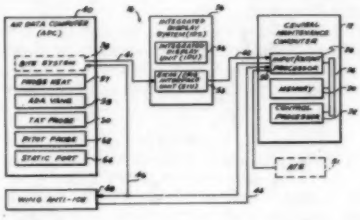
U.S. Cl. 364—424.03 **18 Claims**

1. An onboard central maintenance computer system for an aircraft system, the aircraft system including: (a) a plurality of LRUs; (b) communication means through which the LRUs can transmit LRU fault data and receive test initiation commands; and (c) an operator interface device including (i) presentation means for presenting maintenance information generated by the central maintenance computer system, (ii) input means for receiving input commands, and (iii) interface communication means for transmitting the input commands and receiving the maintenance information, the central maintenance computer system comprising:

(a) data transfer means for transferring data within said central maintenance computer system;

(b) input/output means coupled to the data transfer means, and coupled to the communication means and to the interface communication means for receiving and transmitting data therebetween;

(c) memory means coupled to said data transfer means for storing data including a plurality of preestablished maintenance messages; and,



(d) control processing means coupled to said data transfer means for controlling the transfer and processing of data within said central maintenance computer system and for controlling the operations of said input/output means and said memory means, said control processing means including:

a collection module for causing said input/output means to collect the LRU fault data via the communication means; and

a consolidation module for generating an active maintenance message from the LRU fault data by screening out cascaded faults and consolidating multiple faults to produce an isolated fault, associating said isolated fault with one of said maintenance messages, termed active maintenance message, in said memory means, and causing said active maintenance message to be identified in said memory means.

4,943,920

OPERATION CONTROL METHOD FOR A FRICTIONAL ENGAGEMENT ELEMENT

Takeo Hiramatsu, Nagaokakyo; Tetsuo Ozaki, Gamagoori, and Kenjiro Fujita, Kusatsu, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1988, Ser. No. 182,101

Claims priority, application Japan, Apr. 20, 1987, 62-97023

Int. Cl.[5] B60K *41/18, 41/02*; F16H *5/40*

U.S. Cl. 364—424.1 **8 Claims**

1. An operation control method for a frictional engagement element which includes engaging means and piston means for urging said engaging means to engage, the operation of said piston means being controlled by means of pressurized oil supplied through a hydraulic control device operated in accordance with a control signal to produce an oil pressure of a level corresponding to a value of the control signal input thereto, said piston means having an ineffective stroke section between a first position reached when said pressurized oil is not supplied from said hydraulic control device and a second position just before said engaging means starts to engage,

said method comprising:

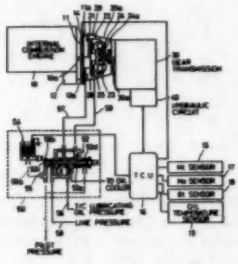
previously storing data representing a relationship between the value of the control signal input to said hydraulic control device and the stroke speed of said piston means;

detecting value of the control signals input to said hydraulic control device while said piston means travels through said ineffective stroke section, and detecting drive periods corresponding individually to said values of the control signals;

obtaining stroke speeds corresponding individually to the detected values of the control signals, based on the previously stored data representing said relationship;

calculating products of the obtained stroke speeds and the detected drive periods corresponding thereto;

calculating an ineffective stroke amount of said piston means



from the sum total of the products of the obtained stroke speeds and the detected drive periods corresponding thereto;

storing the calculated ineffective stroke amount as a new ineffective stroke amount, each time said piston means travels through said ineffective stroke section;

and

obtaining a drive period of said piston means in accordance with the stored new ineffective stroke amount and the value of a desired control signal to be input to said hydraulic control device, and supplying the value of said desired control signal over the obtained drive period, when said piston means is moved through said ineffective stroke section, thereby causing said piston means to reach said second position.

4,943,921

AUTOMATIC TRANSMISSION ELECTRONIC GEARSHIFT CONTROL HAVING ALTITUDE CORRECTED SHIFT CRITERIA

Paul A. Baltusis, Northville; Thomas L. Greene, Plymouth, and Bruce J. Palansky, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 24, 1988, Ser. No. 261,538

Int. Cl.[5] B60K *41/18*; G06F *15/20*

U.S. Cl. 364—424.1 **9 Claims**

1. A method for controlling gearshifts in an automatic transmission of a motor vehicle having an engine, electronic computer, electronic memory accessible to the computer, comprising:

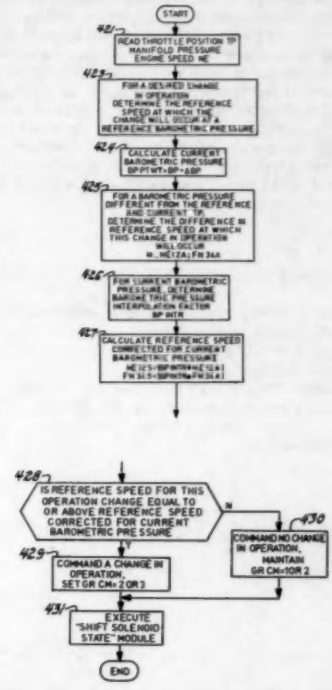
generating an engine speed signal;

storing in memory engine speeds corresponding to a wide open throttle condition at which gearshifts are scheduled to occur at a reference barometric pressure;

calculating a engine speed barometric pressure correction to account for a difference between reference barometric pressure and current ambient barometric pressure;

generating, in response to the engine speed barometric pressure correction, an altitude corrected engine speed signal representing engine speed corresponding to a wide open throttle condition at which gearshifts are to occur at current ambient barometric pressure;

comparing the current engine speed signal to the barometric pressure corrected engine speed signal; and


START
421
READ THROTTLE POSITION TP
MANIFOLD PRESSURE
ENGINE SPEED NE
423
FOR A DESIRED CHANGE IN OPERATION DETERMINE THE REFERENCE SPEED AT WHICH THE CHANGE WILL OCCUR AT A REFERENCE BAROMETRIC PRESSURE
424
CALCULATE CURRENT BAROMETRIC PRESSURE
BPTWT=BP+ΔBP
425
FOR A BAROMETRIC PRESSURE DIFFERENT FROM THE REFERENCE AND CURRENT TP, DETERMINE THE DIFFERENCE IN REFERENCE SPEED AT WHICH THIS CHANGE IN OPERATION WILL OCCUR
426
FOR CURRENT BAROMETRIC PRESSURE, DETERMINE BAROMETRIC PRESSURE INTERPOLATION FACTOR
BPINTR
427
CALCULATE REFERENCE SPEED CORRECTED FOR CURRENT BAROMETRIC PRESSURE
428
IS REFERENCE SPEED FOR THIS OPERATION CHANGE EQUAL TO OR ABOVE REFERENCE SPEED CORRECTED FOR CURRENT BAROMETRIC PRESSURE
N
430
COMMAND NO CHANGE IN OPERATION, MAINTAIN GR CM=1OR 2
Y
429
COMMAND A CHANGE IN OPERATION, SET GR CM= 2 OR 3
431
EXECUTE "SHIFT SOLENOID STATE" MODULE
END

producing a gearshift when the comparison indicates current engine speed exceeds the barometric pressure corrected engine speed.

4,943,922

ANTILOCK CONTROL ASSEMBLY

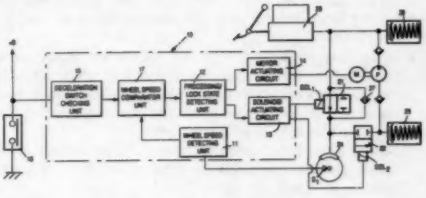
Hirohisa Tanaka, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 29, 1988, Ser. No. 277,196

Claims priority, application Japan, Nov. 30, 1987, 62-304141

Int. Cl.[5] B60T *8/76*

U.S. Cl. 364—426.02 **3 Claims**



1. An antilock control assembly for use in a four-wheel drive vehicle having two front wheels and two rear wheels, said antilock control assembly comprising: a processing/lock-state detecting means for executing arithmetic operations on the basis of wheel speed signals received from wheel speed sensor means to determine whether each of the two front wheels and

two rear wheels are tending to lock or recovering from a locked state and for issuing one of a pressure increase command and a pressure decrease command to increase and decrease a braking fluid pressure on at least one of the two front wheels and two rear wheels; solenoid actuating means for actuating solenoids of pressure control valves in a braking fluid pressure circuit in response to the pressure increase command and the pressure decrease command issued by said processing-/lock-state detecting means; and a pressure reduction command means for calculating a difference between an average wheel speed of the two front wheels and an average wheel speed of the two rear wheels, and for comparing said difference with a preset value, and for issuing a pressure reduction command to at least one of the two front wheels or to at least one of the two rear wheels, the average wheel speed of which is smaller than the other, if said difference is larger than said preset value.

4,943,923

CONSTANT-SPEED RUNNING CONTROL DEVICE FOR VEHICLES

Yasuo Naito, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

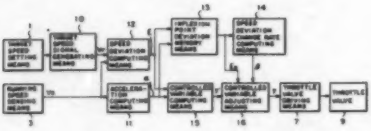
PCT No. PCT/JP87/00514, § 371 Date Mar. 9, 1988, § 102(e) Date Mar. 9, 1988

PCT Filed Jul. 15, 1987, Ser. No. 177,661

Claims priority, application Japan, Jul. 18, 1986, 61-170149

Int. Cl.[5] B60K *31/04*

U.S. Cl. 364—426.04 **3 Claims**



1. A constant-speed running control device for vehicles, comprising:

a running speed sensing means which senses the running speed of a vehicle and produces a running speed signal;

an acceleration computing means for determining acceleration of the vehicle over selected time periods from changes in said running speed signal produced by said running speed sensing means and for generating an acceleration signal;

a target speed setting means for setting a target speed of the vehicle;

a target speed signal generating means for generating a target speed signal as a function of a signal from said target speed setting means;

a speed deviation computing means for determining speed deviation between said target speed signal generated by said target speed signal generating means and said running speed signal and for generating a speed deviation signal;

a driving force control means for controlling a driving force of the vehicle;

a controlled variable computing means for inputting said acceleration signal and said speed deviation signal and computing a controlled variable which controls the driving force of the vehicle such that the target speed signal and the running speed signal agree;

an inflexion point deviation memory means for storing said speed deviation signal at the time of inversion of codes of said acceleration signal;

a speed deviation change rate computing means for measuring a time between consecutive inflexion point deviations stored by said inflexion point deviation memory means, and determining a rate of change of inflexion point deviation; and

a controlled variable adjusting means for adjusting said controlled variable responsive to said speed deviation change rate and said rate of change of inflexion point deviation, and outputting said controlled variable to said driving force control means.

4,943,924

TROUBLE CHECKING APPARATUS

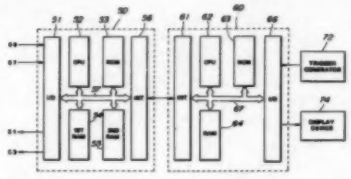
Hidetoshi Kanegae, Tokyo; Minoru Tomikashi, Zushi; Akira Hino, and Takashi Ueno, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jun. 26, 1987, Ser. No. 66,620

Claims priority, application Japan, Jun. 27, 1986, 61-149807; Sep. 24, 1986, 61-0223802

Int. Cl.[5] F02B *3/00*

U.S. Cl. 364—431.12 **16 Claims**



1. An apparatus for use with a device having at least one means for controlling the device, the apparatus comprising:

sensor means sensitive to operating conditions of the device for generating sensor signals indicative of sensed device operating conditions;

a control unit including a first control memory, means responsive to the sensor signals for generating existing values of the sensor signals, means for calculating a value corresponding to a setting of the means for controlling the device from a relationship between the generated existing sensor signal values and the means for controlling the device, the calculating being performed repetitively at uniform intervals, means for converting the calculated value into a setting of the means for controlling the device, means for storing the generated existing sensor signal values in time sequence into the first control memory to provide input data representing variations of the respective sensor signals with time, and means for storing the calculated value in time sequence into the first control memory to provide output data representing variations of the setting of the means for controlling the device with time; and

an analyzing unit including a first analyzer memory, means for manually generating a command signal, means responsive to the command signal for transferring the input and output data from the first control memory to the first analyzer memory, and means for analyzing the input and output data transferred to the first analyzer memory to find a cause of a trouble in the operation of the device.

4,943,925

NAVIGATION APPARATUS BASED ON PRESENT POSITION CALCULATING SYSTEM

Shuzo Moroto; Koji Sumiya; Shouji Yokoyama; Mitsuhiro Nimura, and Akimasa Nanba, all of Anjo, Japan, assignors to Aisin AW Co., Ltd., Anjo, Japan

Filed Oct. 20, 1988, Ser. No. 260,213

Claims priority, application Japan, Oct. 30, 1987, 62-275095; Aug. 11, 1988, 63-202474

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—449 **11 Claims**

10. A navigation apparatus having a present vehicle position locating and tracking system comprising:

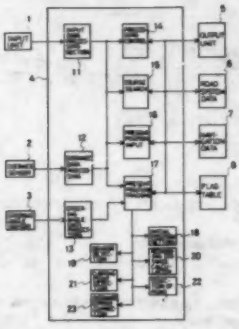
storage means for storing road system data including information about terminal intersections and roads between said terminal intersections,

input means for inputting a destination point,

output means for outputting guidance information,

navigation means connected to said storage means and said input means for, setting a course to said destination point at any of said terminal intersections from said road system data, selecting a road to said destination point, and providing guidance information to said output means, said navigation means including:

guide means for providing said guidance information to said output means at each said terminal intersection while traveling to said destination point,



tracking means for tracking said present vehicle position on said selected road and for detecting a terminal intersection of said selected road, and

road recognition means for recognizing a road in a direction to said destination point from said terminal intersection of said selected road, and

means for performing course guidance when said terminal intersection along said selected road is detected, selecting another road to said destination point at said terminal intersection, providing guidance information corresponding to a terminal intersection of said another selected road, and repeating said course guidance for each subsequent terminal intersection up to said destination point.

4,943,926

METHOD FOR THE ANALYSIS AND SYNTHESIS OF BINARY SIGNALS

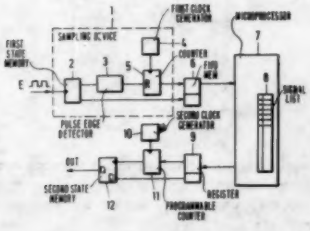
Jorge Guzman-Edery, Heddesheim; Wolfgang Steiger, Lampertheim, and Michael Böer, Mannheim, all of Fed. Rep. of Germany, assignors to BBC Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Oct. 9, 1986, Ser. No. 916,820

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1985, 3536031

Int. Cl.[5] H04L *1/20, 25/04;* **G06F** *15/20*

U.S. Cl. 364—486 **6 Claims**



1. A method for analysis of binary signal pulses having respective pulse durations and pulse states, which comprises the steps of: measuring the duration of each signal pulse by counting units of time in a counter while receiving the pulses; determining the pulse state by means of a state memory; resetting the counter at each pulse state change transferring as signal bytes the counter-reading and respective pulse state reached into a fifo memory at a further pulse state change; resetting and restarting the counter; transferring the signal bytes to a signal list in a microprocessor; taking the signal bytes from the signal list for retransmission of signals and loading the signal bytes into a register; controlling a programmable counter on the basis of the counter-reading of the signal bytes; determining the respective duration of the signal pulses to be retransmitted on the basis of the respective counter-reading; determining the state of the respective pulses to be retransmitted by means of the state bit of the respective signal bytes; forming distortion tables in an associate memory; addressing the distortion tables by means of the counter information of the signal bytes deposited in the signal list; and reading the signal distortion values from said distortion tables.

4,943,927

CONTROLLING AND SUPERVISING SYSTEM FOR LOOM

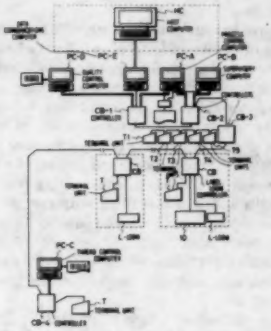
Takao Yarita, Chiba; Yutaka Moro, Kanagawa; Kazuyasu Takeishi, Kanagawa, and Shinichi Ohashi, Kanagawa, all of Japan, assignors to Ichikawa Woolen Textile Co., Ltd., Japan

Filed Jul. 22, 1988, Ser. No. 223,137

Claims priority, application Japan, Aug. 5, 1987, 62-194319

Int. Cl.[5] G06F *15/46;* **D03D** *51/00*

U.S. Cl. 364—470 **2 Claims**



1. A controlling and supervising system for a loom, comprising:

a network means for interconnecting computers connected to said network means;

a host computer connected to said network having data files containing dispatching data and production instructions for various units and devices also connected to said network means;

a data-communication personal computer connected to said network means for receiving data transmitted from said host computer in file and for loading the received data into said various units and devices via said network means;

a plurality of supervisory personal computers for storing the data from said data-communication personal computer and further for downloading said data with the addition of operating data, and also for supervising with signals received from said loom;

and a controller installed between said loom and said plurality of supervisory personal computers for operating and controlling said loom based on data from said supervisory personal computer and controlling access to input to

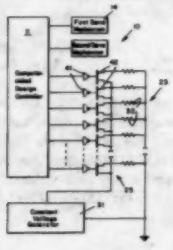
signals from said loom and operation and control data for operating and controlling such equipment and loading the same into said supervisory personal computer, wherein said loom comprises an automatic cop-replacing apparatus for replacing a cop of weft accommodated in a shuttle and tying a new weft and an existing weft.

4,943,928

ELONGATED CARRIER WITH A PLURALITY OF SPOT-SOURCES OF HEAT FOR USE WITH STEREOLITHOGRAPHIC SYSTEM

Albert E. Campbell, 275 W. Lemon, Arcadia, Calif. 91104; William F. Hug, 2239 E. Paloma St., Pasadena, Calif. 91006, and Ray D. Reid, 921 Englewild, Glendora, Calif. 91740

Filed Sep. 19, 1988, Ser. No. 246,503
Int. Cl.[5] G06F 15/46; B29C 35/08
U.S. Cl. 364—477 **4 Claims**



1. An improvement for use in a stereolithographic system for producing a three-dimensional object from a heat curable fluid medium which is capable of solidification when subjected to heat, the stereolithographic system including:

a. a computer-aided design controller which generates a plurality of sets of output signals each set of which corresponds to one of a plurality of successive cross-sectional laminae of a three-dimensional object;

b. a container which has a front wall, a rear wall and two side walls and which is filled with the heat curable fluid medium the surface of which provides a designated working surface;

c. an elevator platform which is movably coupled to the container and which is disposed in the heat curable fluid medium; and

d. a servo mechanism which incrementally drives the elevator platform in response to the output signals, said improvement comprising:

a. an elongated carrier which has a bottom surface and which is disposed perpendicular to the two side walls and parallel to the front and rear walls of the container;

b. driving means for incrementally driving said elongated carrier along the two side walls of the container in response to the output signals;

c. a plurality of spot-sources of heat, each of said spot-sources of heat being individually switched on and serially disposed on and fixedly coupled to said bottom surface of said elongated carrier adjacent to the designated working surface; and

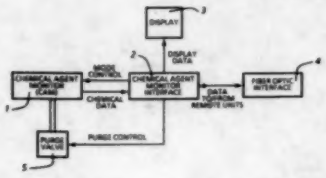
d. switching means for individually switching on each of said spot-sources of heat in response to each set of output signals whereby said bottom surface of said elongated carrier travels across the plane of the designated working surface in order to produce a cross-sectional lamina and when the cross-sectional lamina has been produced the elevator platform moves incrementally down the thickness of one of the cross-sectional laminae in order to produce the next cross-sectional laminae.

4,943,929

CHEMICAL AGENT MONITOR AND CONTROL INTERFACE

Adam J. Simonoff, Dahlgren, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1988, Ser. No. 267,152
Int. Cl.[5] G06F 15/46; G01N 31/00
U.S. Cl. 364—496 **5 Claims**



1. A chemical agent monitor control interface system comprising:

a chemical agent monitor;

means for inputting serial data from said chemical agent monitor;

means for outputting electrical control signals to said chemical agent monitor;

means for fiber optically linking control and status signals within the system;

a purge valve connected to said chemical agent monitor for purging said chemical agent monitor whereby said monitor can be purged remotely by manual or automatic control;

means for processing to provide programmed control of said chemical agent monitor and said purge valve; and

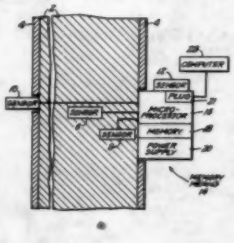
means for outputting display data from said means for processing whereby operators can discern the system status and any chemical hazard detected by said chemical agent monitor.

4,943,930

METHOD AND APPARATUS FOR NON-DESTRUCTIVE EVALUATION OF CONCRETE

Farrokh F. Radjy, Gateway Twrs. 18L, Pittsburgh, Pa. 15222

Continuation of Ser. No. 853,682, Apr. 18, 1986, abandoned. This application Nov. 8, 1989, Ser. No. 434,564
Int. Cl.[5] G01N 3/26
U.S. Cl. 364—506 **17 Claims**



10. An apparatus for non-destructive strength evaluation of a concrete mass comprising:

(a) an internal temperature sensor for implanting in said concrete mass;

(b) a reference temperature sensor for attaching externally to said concrete mass;

(c) a microprocessor connected to said internal temperature

sensor and said reference temperature sensor, said microprocessor for recording signals from said internal temperature sensor and said reference temperature sensor;

(d) a computer for evaluating signals from said microprocessor; and

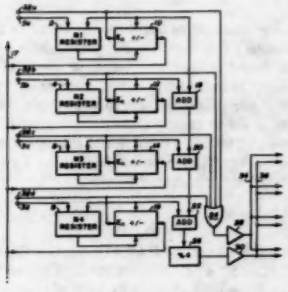
(e) means for transferring from said microprocessor said signals from said internal temperature sensor and said reference temperature sensor to said computer such that said computer can determine the strength of said concrete mass.

4,943,931

DIGITAL ARTIFICIAL NEURAL PROCESSOR

Reginald A. Allen, Vista, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed May 2, 1988, Ser. No. 189,438
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—513 **6 Claims**



6. In an artificial neural system containing a plurality of digital artificial neural processors, the improvement wherein each of said digital artificial neural processors comprise:

a plurality of primary binary registers for receiving and storing binary numbers and a corresponding plurality of buffer registers, with one buffer register in said plurality being associated with a corresponding one of said primary registers; each said buffer registers being of the incrementing and decrementing type and being coupled to an associated primary register for initially receiving and storing a copy of the binary number contained in said associated primary register; means for applying a first type signal and a second type signal to each of said buffer registers to selectively increment or decrement the number stored in said buffer register responsive to said first type signal during the presence of said second type signal; means for resetting said primary registers subsequent to incrementing or decrementing the number stored in the associated buffer register; and means for processing the numbers stored in said buffer registers to provide at an output a number representing the average of the numbers stored in said plurality of buffer registers.

4,943,932

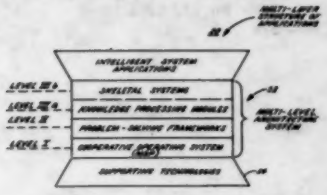
ARCHITECTURE FOR COMPOSING COMPUTATIONAL MODULES UNIFORMLY ACROSS DIVERSE DEVELOPMENTAL FRAMEWORKS

Jay S. Lark, Mountain View; Lee D. Erman, Palo Alto; Michael Fehling, Mountain View, and Frederick Hayes-Roth, Atherton, all of Calif., assignors to Cimflex Teknowledge Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 934,649, Nov. 25, 1986, abandoned. This application Apr. 15, 1987, Ser. No. 38,872
Int. Cl.[5] G06F *15/20, 15/18*
U.S. Cl. 364—513 **84 Claims**

1. A flexible computing system for developing application-specific computer systems, said flexible computing system comprising:

module production means for generating functioning modules by interpreting preselected descriptions of the functional characteristics of modules to be included in a desired application-specific computing system, and



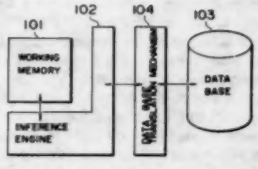
module assembly means for generating said application-specific system by combining message passing means for intermodule communication along with the functioning modules generated by said module production means.

4,943,933

METHOD FOR TRANSLATING DATA BASE TO KNOWLEDGE AND APPARATUS THEREFOR

Hironori Miyamoto, Yokohama; Hidefumi Kondo, Yamato; Hirohide Haga, and Rinichi Takashi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 17, 1988, Ser. No. 272,727
Claims priority, application Japan, Nov. 20, 1987, 62-292176
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—513 **5 Claims**



1. A method for translating data in a data base to knowledge in an expert system, the expert system drawing inferences based on the knowledge, the method comprising the steps of:

preparing a correspondence relation table defining a correspondence relation between the knowledge and the data base;

reading data from the data base each time knowledge related to the data base is referenced by the correspondence relation table during an inference by the expert system and translating the data to knowledge; and

translating knowledge related to the data base prepared by the correspondence relation table during the inference into data of the data base using the correspondence relation table, and storing the translated knowledge in the data base,

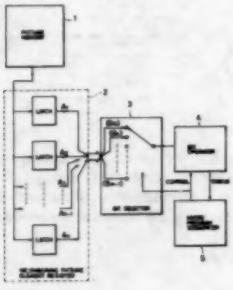
whereby data of the data base can be accessed from said expert system in a knowledge form.

4,943,934

PICTURE OPERATION UNIT FOR PERFORMING OPERATIONS ON INTENSITY DATA OF NEIGHBORING PICTURE ELEMENTS

Makoto Hosoda, and Toshio Shiomi, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 3, 1987, Ser. No. 128,187
Int. Cl.[5] G06F *15/66*
U.S. Cl. 364—518 **1 Claim**



1. A neighboring picture operation unit for carrying out data operations on data for a plurality of picture elements stored in a picture memory, comprising:

a register means for storing a predetermined amount of data corresponding to intensity information of the picture elements stored in the picture memory;

a bit selector for reading out data from said register means for each of the plurality of picture elements according to a selected bit position of the data in the picture memory; and

a bit operator for performing the data operations on the data corresponding to the selected bit position including

a programmable logic array for performing binomial operations in parallel on said data corresponding to the selected bit position, said programmable logic array having an output, a first input and a second input, said first input connected to the output of said bit selector,

a pattern generating read only memory for generating a sequence of bits and for applying the bits generated to said second input of the programmable logic array,

a look-up table for detecting a condition at the output of said programmable logic array and generating a value corresponding to the detected condition, and

an arithmetic and logic unit for comparing said value generated by said look-up table to a value corresponding to the result of the operation performed on the plurality of picture elements stored in said register means,

said bit operator performing said operations on said data corresponding to said selected bit position in accordance with data corresponding to other bit positions of the stored data in said register means.

4,943,935

APPARATUS AND METHOD FOR PLOTTING CURVED FIGURES REPRESENTED BY HIGH ORDER FUNCTIONS IN A BIT MAP

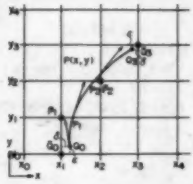
Fumitaka Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 23, 1988, Ser. No. 248,450
Claims priority, application Japan, Sep. 25, 1987, 62-241434
Int. Cl.[5] G06F *15/62*
U.S. Cl. 364—518 **16 Claims**

1. An apparatus for plotting a curved figure defined by loci of first and second functions having a common variable, the first and second functions being nth order functions (where n is an integer greater than two), comprising:

bit map memory means for storing dots representing the curved figure, a previous dot of the dots being stored at a coordinate point designated by first and second previous coordinate values;

coordinate value determining means for determining a current value of the variable in accordance with a previous value of the variable, a predetermined integer and a slope



of the first function at the previous value of the variable, determining a first current coordinate value by adding the predetermined integer to the first previous coordinate value, and determining a second current coordinate value in accordance with a current function value of the second function at the current value of the variable; and

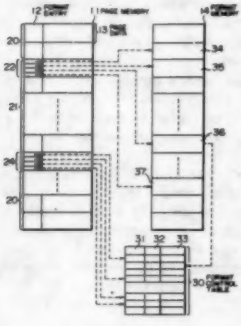
plot means for plotting a current dot in said bit map memory means at a coordinate point designated by the first and second current coordinate values.

4,943,936

PRINT CONTROL APPARATUS CONTROLLING UTILIZATION STATE OF PLURAL FORMAT BLOCKS

Kenshi Hirai; Hiromichi Murakami, both of Hadano, and Kikuo Hatazawa, Atsugi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 12, 1988, Ser. No. 143,090
Claims priority, application Japan, Jan. 29, 1987, 62-17165
Int. Cl.[5] G06F *3/12*
U.S. Cl. 364—519 **6 Claims**



1. A print control apparatus comprising:

a format memory for storing a plurality of format data entries supplied from a host computer, said format memory being subdivided into a plurality of blocks;

a page memory for storing a plurality of print data items and corresponding first information items, said first information items representing, for each print data item, one of said format data entries stored in said format memory to be overlayed with the corresponding print data items, said print data items and first information items being supplied form said host computer;

printing means connected to said format memory and said

page memory for overlaying and printing the print data items according to the format data entry represented by said first information items associated with the print data items; and

a format control table connected to said format memory for storing a plurality of second information items corresponding to the blocks in said format memory, each of said second information items indicating the status of a format data entry stored in the corresponding block;

wherein said host computer stores new format data entries into said blocks in the format memory in accordance with the status of said block indicated by the corresponding second information items stored by said format control table.

4,943,937

APPARATUS FOR PROCESSING IMAGES HAVING DESIRED GRAY LEVELS INCLUDING A THREE-DIMENSIONAL FRAME MEMORY

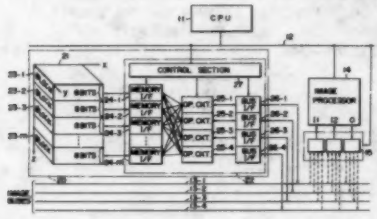
Akira Kasano, and Yoichi Inoue, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1988, Ser. No. 173,752

Claims priority, application Japan, Mar. 31, 1987, 62-78590

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—521 **12 Claims**



1. An image processing apparatus comprising:

three-dimensional frame memory means for storing image data, and comprising a plurality of memory planes logically stacked in the depth direction;

memory control means, connected to said frame memory means, for independently accessing a plurality of desired memory areas of said frame memory means, each of said desired memory areas located in any desired position in the depth direction of said frame memory means and having a desired number of bits in the depth direction;

a plurality of image bus means, connected to said memory control means, for transferring image data;

image processor means, connected to said plurality of image bus means, for receiving the image data from at least one of said plurality of image bus means and performing logical operations on the image data nd for outputting the result of the performed operations to at least one of the other plurality of image bus means; and

control means connected to said memory control means and said image processor means, said control means designating access areas of said frame memory means which are to be accessed by said memory control means and the type of access to be performed in respect of each access area, and said control means allocating said plurality of image bus means to said memory control means and said image processor means for each access area.

4,943,938

SYSTEM FOR DISPLAYING SHADED IMAGE OF THREE-DIMENSIONAL OBJECT

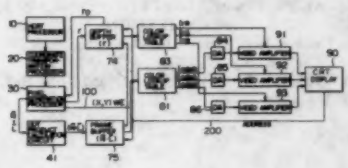
Toshihisa Aoshima, Tokyo; Seiichi Kanema, Yokohama, and Takeshi Kato, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 14, 1986, Ser. No. 918,335

Claims priority, application Japan, Oct. 11, 1985, 60-224716

Int. Cl.[5] G06F *15/72*

U.S. Cl. 364—522 **4 Claims**



1. A display system for displaying a two-dimensional graphic obtained when a three-dimensional graphic to be displayed is projected on a two-dimensional screen, said display system comprising:

display means including a scanned display screen having a plurality of display pixels thereon;

first means for producing a depth value signal and a normal direction signal for each of those display pixels included in the two-dimensional graphic from among said plurality of display pixels, the depth value signal indicating the distance from a predetermined hypothetical viewing point to the point on the three-dimensional graphic corresponding to the position of each display pixel, the normal direction signal indicating the normal direction to the surface of the three-dimensional graphic at said corresponding point for each display pixel;

second means connected to said first means and responsive to each of the depth value signals for producing a first reflection light intensity signal for each display signal, the first reflection light intensity signal indicating the portion of the entire reflection light intensity at said corresponding point resulting from the depth value signal for each display pixel when said corresponding point is viewed from said hypothetical viewing point as the three dimensional graphic is illuminated by a hypothetical light source, said second means including:

(a) first frame buffer means having a memory region corresponding to each display pixel of an image to be displayed on said display means, for storing the depth value signal for said corresponding point and outputting the stored depth value signal in synchronism with scanning of said display means, and

(b) first-reflection-light control means connected to said first frame buffer means and responsive to a depth value signal from said first frame buffer means for producing a first reflection light intensity signal for the associated display pixel;

third means connected to said first means and responsive to each of the normal direction signals for producing a second reflection light intensity signal for each display pixel, the second reflection light intensity signal indicating the portion of the entire reflection light intensity at said corresponding point resulting from the normal direction for each display pixel; and

fourth means, connected to said display means, said second means and said third means and responsive to said first and second reflection light intensity signal for each display pixel for controlling a reflection light intensity signal to be sent to said display means for each of said plurality of display pixels;

said first means including means connected to said first frame buffer means for producing a depth value signal

associated with a point on the three-dimensional graphic to be displayed on said display means and determining whether the produced depth value signal represents a depth value smaller than the depth value represented by the depth value signal already stored in said first frame buffer means for the display pixel associated with the point to be displayed; and means for inhibiting display of the point when the determination is that the produced depth value signal represents a smaller depth value than that represented by the already stored depth value signal.

4,943,939

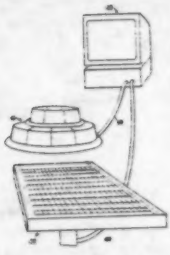
SURGICAL INSTRUMENT ACCOUNTING APPARATUS AND METHOD

Rocklin Hoover, Rte. 3, Box 314x-4, Sumter, S.C. 29154

Filed Aug. 29, 1988, Ser. No. 237,730

Int. Cl.[5] **G06F** *15/20;* **G01N** *15/00;* **G06M** *7/00;* **B65D** *83/10*

U.S. Cl. 364—555 **24 Claims**



1. An apparatus for accounting for standard surgical instruments used during surgery, such as clamps, hemostats and the like, dispensed into and removed for storage out of an operating environment to avoid leaving surgical instruments in said operating environment, said apparatus comprising:

a means for dispensing surgical instruments into said operating environment, said dispensing means having a first signalling means for signalling dispensing of one of said surgical instruments;

a means for storing surgical instruments withdrawn from said operating environment, said storing means having a second signalling means for signalling a storing of one of said surgical instruments; and

a computer means connected to said dispensing and said storing means for receiving said signaled dispensing and said signaled storing of said surgical instruments, for computing a first number and a second number of said surgical instruments dispensed into and received for storing out of said operating environment, respectively, and for subtracting said second number from said first number to determine a third number of said surgical instruments that have been dispensed by said dispensing means into said surgical environment but are not being stored by said storing means out of said surgical environment.

4,943,940

FLOATING POINT ADD/SUBTRACT AND MULTIPLYING ASSEMBLIES SHARING COMMON NORMALIZATION, ROUNDING AND EXPONENTIAL APPARATUS

Bernard J. New, Los Gatos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 27, 1984, Ser. No. 655,482

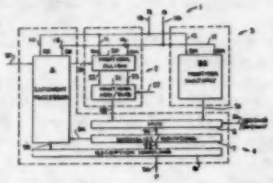
Int. Cl.[5] **G06F** *7/48*

U.S. Cl. 364—748 **9 Claims**

1. A fully combinatorial arithmetic apparatus for operating on a first and a second number, each of said numbers having a mantissa and an exponential component, comprising:

means for processing the exponential components of said first and said second numbers;

means coupled in parallel with said processing means and responsive to a control signal therefrom for aligning said mantissa of one of said numbers with said mantissa of the other of said numbers;



means serially coupled to said aligning means for selectively adding or subtracting said mantissas of said first and said second numbers after they are aligned;

means coupled in parallel with said processing means and said aligning and adding or subtracting means for multiplying said mantissas of said first and said second numbers;

means for normalizing and rounding a mantissa, said normalizing and rounding means having an output coupled to said processing means for controlling the magnitude of an exponent from said processing means; and

multiplexer means which is responsive to a control signal for selectively coupling outputs from said aligning and adding or subtracting means or said multiplying means to said normalizing and rounding means.

4,943,941

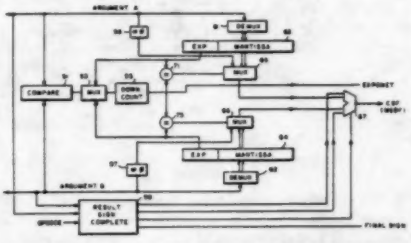
FLOATING POINT PROCESSOR EMPLOYING COUNTER CONTROLLED SHIFTING

Edward S. Harriman, Jr., Billerica, Mass., assignor to Bolt Beranek and Newman Inc., Cambridge, Mass.

Filed Jan. 13, 1989, Ser. No. 296,617

Int. Cl.[5] **G06F** *7/38*

U.S. Cl. 364—748 **6 Claims**



1. Apparatus for performing floating point addition or subtraction on a pair of binary arguments, each of which includes an exponent portion and a mantissa portion, said apparatus comprising:

means for examining said arguments thereby to determine which argument is the larger;

counter means;

means for loading a value corresponding to the exponent portion of the larger argument into said counter;

arithmetic circuit means for generating carry save form result exponent and mantissa portions from corresponding portions of a pair of arguments presented to said arithmetic circuit means;

respective means for selectively transferring at least parts of each of the mantissas into said arithmetic circuit means, most significant bits being transferred first;

means for comparing each of the exponents with the current value held by said counter;

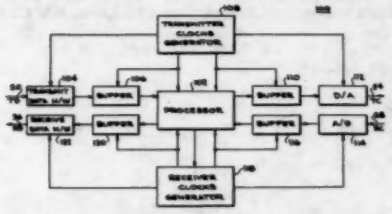
control means for stepping said counter and for controlling said respective transferring means in response to said comparing means to initiate transferring of each mantissa when the value held by said counter corresponds to the respective exponent.

4,943,942

FULL-DUPLEX MODEM USING A SINGLE PROCESSOR

Dermot Dunnion, Santa Clara, Calif., assignor to Advanced Micro Devices, Sunnyvale, Calif.

Filed Sep. 19, 1986, Ser. No. 910,111
Int. Cl.[5] H04J 3/12
U.S. Cl. 364—900 1 Claim



1. A full-duplex modem receiving digital data (TD) signals to be transmitted as analog data signals (TC) and receiving analog data signals (RC) to be converted to received digital data signals (RD), said modem receiving a transmit-enable signal and a receive-enable signal, said modem comprising:

means for generating a plurality of transmitter clock signals;

means for generating a plurality of receiver clock signals;

means responsive to one of said transmitter clock signals, for receiving said TD signals and synchronously generating therefrom signals at a predetermined rate Tx1;

first means for temporarily storing a predetermined number (N_T) of said synchronous signals generated from said TD signals;

means responsive to one of said receiver clock signals, for receiving said RC signals and synchronously generating therefrom digital signals at a predetermined multiple (N_R) of a predetermined rate Rx1;

second means for temporarily storing said predetermined multiple N_R of said synchronous signals generated from said RC signals;

memory means for storing programs and data;

programmable digital processor means, operably connected to said memory means, responsive to said transmit- and receive-enable signals and responsive to at least one of said transmitter clock signals, and to at least one of said receiver clock signals, for sampling said temporarily-stored signals generated from said TD signals, for executing a transmit-side signal processing procedure thereon and for generating therefrom digitized transmit signals, for sampling said temporarily-stored signals generated from said RC signals, for executing a receive-side signal processing procedure thereon and for generating therefrom digitized receive signals;

third means reponsive to one of said transmitter clock signals for temporarily storing said digitized transmit signals;

means responsive to one of said transmitter clock signals for converting said temporarily-stored digitized transmit signals to said analog data signals (TC);

fourth means responsive to one of said receiver clock signals for temporarily storing said digitized receive signals; and

means responsive to one of said receiver clock signals for receiving said temporarily-stored digitized receive signals and synchronously generating therefrom said received digital data signals (RD) at said predetermined rate Rx1;

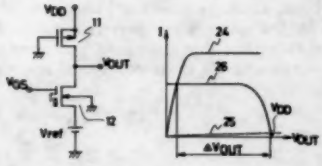
wherein said processor means have a maximum, minimum, respectively, delay between reception of said transmit-enable signal and beginning execution of said transmit-side processing procedures of Δ_T, Δ_T, respectively, and has a maximum, minimum, respectively, delay between reception of said receive-enable signal and beginning execution of said receive-side processing procedures of Δ_R, Δ_R, respectively, wherein said third means temporarily stores $N_T+N_T\cdot(Tx1)\cdot(\Delta_T-\Delta_T)$ digitized transmit signals and wherein said second means temporarily stores $N_R+N_R\cdot(Rx1)\cdot(\Delta_R-\Delta_R)$ of said RC signals whereby said programmable digital processor means executes said transmit-side and said receive-side signal-processing procedures in time according to a predetermined schedule.

4,943,943

READ-OUT CIRCUIT FOR SEMICONDUCTOR NONVOLATILE MEMORY

Yutaka Hayashi, 1-4, 1-chome, Umezono, Szkurumura, Niihari-gun, Ibarakiken; Yoshikazu Kojima, 31-1, Kameido 6-chome, Koto-ku, Tokyo; Masaaki Kamiya, 31-1, Kameido 6-chome, Koto-ku, Tokyo, and Kojiro Tanaka, 31-1, Kameido 6-chome, Koto-ku, Tokyo, all of Japan

Filed Jul. 24, 1984, Ser. No. 633,863
Claims priority, application Japan, Aug. 11, 1983, 58-147105
Int. Cl.[5] G11C 7/00; H01L 29/78
U.S. Cl. 365—185 8 Claims



1. A read-out circuit for a non-volatile semiconductor memory comprising: a semiconductor substrate; a first region and a second region disposed in spaced-apart isolation from one another adjacent to the surface of said semiconductor substrate; a first gate insulating layer on said second region; a channel extending between said first region and said second region, the channel having a first channel region and a second channel region in contact with one another, the second channel region being in contact with the second region; a second gate insulating layer on said first channel region; a third gate insulating layer on said second channel region; a floating gate electrode on said first and third gate insulating layers for inverting said second channel region in response to a charged state thereof and capacitively coupled to said second region; a select gate electrode on said second gate insulating layer; means for keeping the voltage of said second region constant relative to said semiconductor substrate in order to keep the voltage of said floating gate electrode constant by the capacitance coupling between said second region and said floating gate electrode; and means for applying a voltage to said select gate electrode for inverting said first channel region in order to read out the charged state of said floating gate electrode by an output voltage at the first region induced by the current flowing between said first region and said second region.

4,943,944

SEMICONDUCTOR MEMORY USING DYNAMIC RAM CELLS

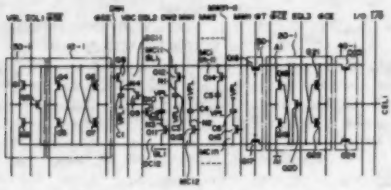
Koji Sakui; Tsuneaki Fuse, both of Tokyo, and Fujio Masuoka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 23, 1988, Ser. No. 275,501
Claims priority, application Japan, Nov. 25, 1987, 62-296813; Nov. 25, 1987, 62-296814; Nov. 25, 1987, 62-296815; Nov. 25, 1987, 62-296822; Nov. 25, 1987, 62-296823
Int. Cl.[5] G11C 7/00
U.S. Cl. 365—189.05 21 Claims

1. A semiconductor memory device comprising:

a plurality of bit lines and a plurality of word lines disposed perpendicular to one another on a semiconductor substrate;

a plurality of dynamic memory cells disposed at intersections of said bit lines and said word lines;
equalizer means connected to said bit lines;
sense amplifier means connected to said bit lines;
latch means connected to said bit lines; and



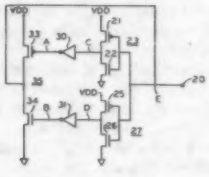
means, for, when a row address strobe signal for loading a row address into the memory device is active during a read cycle, selecting a word line, causing said latch means to latch data read from memory cells connected to the selected word line, then ceasing the selection of said word line, and causing said equalizer means to preset a level of the bit lines.

4,943,945

REFERENCE VOLTAGE GENERATOR FOR PRECHARGING BIT LINES OF A TRANSISTOR MEMORY

Fang-shi Lai, Baldwin, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 13, 1989, Ser. No. 365,579
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—189.09 **6 Claims**



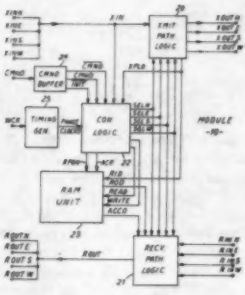
1. In a solid state memory device, a threshold generator for generating a reference potential for precharging bit lines of said memory comprising:
a first inverter circuit having a threshold voltage below said reference potential;
a second inverter circuit having a threshold voltage above said reference voltage, said first and second inverters having a common input connection;
voltage drive means to supply a current from a voltage source VDD, in response to an output signal of said first inverter circuit, and for discharging a current from said bit line in response to an output signal of said second inverter circuit; and,
a bit line driving connection connecting said voltage drive means and inverter circuit common input connection, said inverter circuits supplying a charging current and discharging current to and from said bit line to maintain a voltage on said bit line driving connection within a range defined by said threshold voltages.

4,943,946

CONTROL SYSTEM FOR CHAINED CIRCUIT MODULES

Michael Brent, London, England, assignor to Anamartic Limited, Milton, Mass.

PCT No. PCT/GB86/00401, § 371 Date Mar. 12, 1987, § 102(e) Date Mar. 12, 1987, PCT Pub. No. WO87/00675, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 11, 1986, Ser. No. 27,167
Claims priority, applicstion United Kingdom, Jul. 12, 1985, 8517699
Int. Cl.[5] G11C *7/00*; G06F *1/00*
U.S. Cl. 365—189.12 **21 Claims**



1. A system of circuit modules connected in a chain, each module having an input terminal and an output terminal connected to said input terminal of the next module in the chain, each module including a function unit for operating on data and control means for causing the module to execute selected ones of a repertoire of commands, said control means of each module including serial logic connected from said input terminal to said output terminal of said module, for passing digital signals from module to module, said control means of each module comprising a shift register arrangement comprising a series of shift register stages, at least one of which is included within said serial logic and said system comprising a source of clock pulses distributed to all said shift register arrangements for clocking digital signals therethrough, a power supply source connected to all modules, means for launching a token consisting of at least one bit into said chain to be clocked by said clock pulses along said serial logic of said modules in sequence, a global command line extended to said control means of all said modules for the application of global command signals substantially simultaneously to all said control means, and means for applying a first command signal to said global command line at a predetermined time after said token was launched and, when said token is present in said serial logic of a selected module, said control means being responsive to receipt of said first command signal coincidentally with the presence of said token to execute a first selected one of said repertoire of commands.

4,943,947

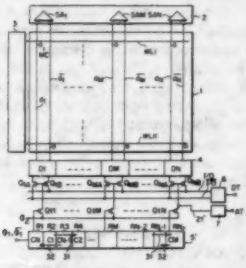
SEMICONDUCTOR MEMORY DEVICE WITH AN IMPROVED SERIAL ADDRESSING STRUCTURE

Yasuaki Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,446
Claims priority, application Japan, Sep. 9, 1987, 62-227178
Int. Cl.[5] G11C *7/02*
U.S. Cl. 365—189.12 **6 Claims**

1. A semiconductor memory comprising; first to M-th data holding circuits arranged in a first direction, each of said data holding circuits storing digital information, a common data line, first to M-th selection circuits coupled between said plu-

rality of data holding circuits and said common data line, respectively, an output circuit having an input end coupled to said common data line, a serial addressing circuit for serially applying a selection signal to said selection circuits, said serial addressing circuit including a shift register having first to M-th (M being a positive integer more than 2) shift stages arranged in said first direction, said first to M-th shift stages being alternately classified into first and second groups, the shift stages of said first group being electrically connected in cascade for



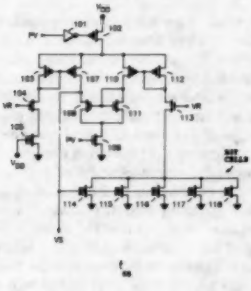
operation in such manner that said selection signal is consecutively shifted towards said M-th shift stage in said first direction only through the shift stages of said first group, the shift stages of said second group being electrically connected in cascade for operation in such manner that said selection signal is consecutively shifted from said M-th shift stage towards said first stage only through the shift stages of said second group in a second direction opposite to said first direction, and means for transferring said selection signal from one of said first and second shift stages to the other of said first and second stages.

4,943,948

PROGRAM CHECK FOR A NON-VOLATILE MEMORY

Bruce L. Morton, Round Rock; Bruce E. Engles, Austin, and Michael H. Chaddock, Round Rock, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 5, 1986, Ser. No. 871,214
Int. Cl.[5] G11C *7/00*
U.S. Cl. 365—201 **5 Claims**



1. In a memory having an array of non-volatile memory cells which are in either a programmed or unprogrammed state, wherein a memory cell in the programmed state has a conductivity on one side of a first magnitude and a memory cell in the unprogrammed state has a conductivity on the other side of the first magnitude, a circuit comprising:

reference means for selectively providing a reference at a conductivity of a second magnitude or a conductivity of a third magnitude;

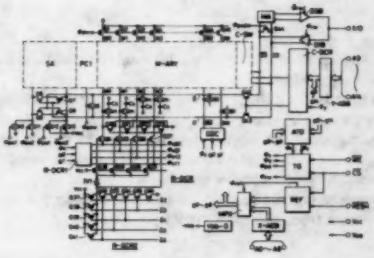
sense amplifier means, coupled to the reference means, for determining if a selected cell is in the programmed or unprogrammed state when the reference means provides the reference at a conductivity of the second magnitude and for determining if a selected cell has a conductivity less than a fourth magnitude when said reference means provides the reference at a conductivity of the third magnitude, said fourth magnitude being on said one side of said first magnitude.

4,943,949

SEMICONDUCTOR MEMORY INCLUDING MEANS FOR NOISE SUPPRESSION

Yasunori Yamaguchi, Tachikawa; Kanji Oishi, Koganei, and Kazuyuki Miyazawa, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 802,197
Claims priority, application Japan, Nov. 26, 1984, 59-248105
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—206 **20 Claims**



1. A semiconductor memory comprising:

a reference potential generating circuit;

a first data line adapted to be supplied with a reference potential from said reference potential generating circuit;

a second data line paired with said first data line and adapted to be supplied with said reference potential from said reference potential generating circuit;

a word line adapted to be fed with a selection signal;

a dummy word line adapted to be fed with a drive signal which is synchronized with said selection signal;

a dynamic memory cell coupled to said word line and to said first data line, and including an address selecting MOSFET and an information storing capacitor, wherein said dynamic memory cell sets the potential of said first data line at a higher or lower level than the reference potential at said second data line when said dynamic memory cell is selected by said selection signal being fed to said word line;

a sense amplifier for amplifying a level difference which occurs between said first data line and said second data line when said dynamic memory cell is selected; and

a dummy capacitor which is coupled between one of said second or first data lines and said dummy word line and which imparts noise to said one of said second or first data line in response to said drive signal being fed to said dummy word line to reduce noise between said first and second data lines which is caused by operation of said address selecting MOSFET when said dynamic memory cell is selected.

wherein said dummy capacitor comprises a MOS capacitor,

wherein said MOS capacitor comprises a MOSFET having a gate electrode coupled to said dummy word line and a current carrying electrode coupled to said second or first data line, and

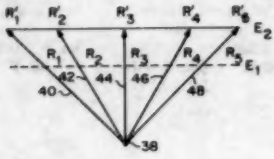
wherein the MOSFET acting as said MOS capacitor is a depletion mode MOSFET.

4,943,950

METHOD FOR MIGRATING SEISMIC DATA

Craig J. Beasley; Walter S. Lynn, and Ronald E. Chambers, all of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed May 26, 1989, Ser. No. 363,666
Int. Cl.[5] G01V *1/36*
U.S. Cl. 367—50 **11 Claims**



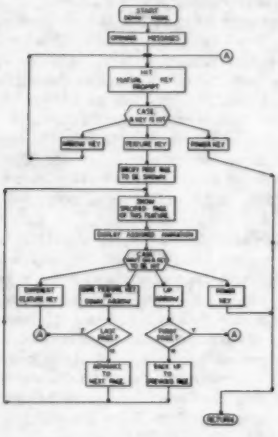
1. An improved method for migrating seismic data, comprising the steps of:
(a) time-shifting the seismic data from a surface elevation to a datum elevation;
(b) migrating the seismic data between the datum elevation and the surface elevation with a migration velocity substantially equal to zero; and
(c) migrating the seismic data below the surafce elevation with a true migration velocity.

4,943,951

DEPTH FINDER WITH TUTORIAL

David R. Leavell, Columbus, Ga.; Earl W. Spencer, Jr., Montgomery, Ala., and Bruce L. Bacon, Columbus, Ga., assignors to Microsonics, Inc., Columbus, Ga.

Filed Jul. 17, 1989, Ser. No. 380,796
Int. Cl.[5] G01S *15/96*
U.S. Cl. 367—111 **10 Claims**



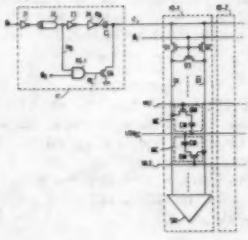
1. A depth finder for use on a boat to locate underwater structure and fish using reflected sonic energy comprising:
(a) transmitter means for generating repetitive signals;
(b) transducer means for converting said signals into sonic energy and directing said energy into a body of water such that reflected sonic energy incident on said transducer means is converted into a reflected energy signal;
(c) receiver means for receiving said reflected energy signal;
(d) programmable computer means operatively connected to said transmitter means and said receiver means to receive electronic information therefrom and to provide control signals thereto in accordance with a plurality of operating modes programmed within said programmable computer means;
(e) display means operatively connected to said programmable computer means for displaying visual graphic representations corresponding to said reflected energy signal;
(f) manually operable input means for providing command signals to said programmable computer means; and
(g) means associated with said programmable computer means for providing a tutorial display on said display means to explain the proper operation of said depth finder, said means being interactive with said input means and said programmable computer means to display instructional information stored therein responsive to manual operation of said input means.

4,943,952

SEMICONDUCTOR MEMORY CIRCUIT WITH IMPROVED BIT LANE PRECHARGE CIRCUIT

Kazuyoshi Terayama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 27, 1988, Ser. No. 290,007
Claims priority, application Japan, Dec. 25, 1987, 62-331814
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—207 **7 Claims**



1. A semiconductor memory circuit comprising: a pair of bit lines, a plurality of word lines intersecting with said pair of bit lines, a plurality of dynamic type memory cells coupled to said word lines and said bit lines, a sense amplifier coupled to said pair of bit lines for operatively amplifying one of said pair of bit lines to a first voltage and the other of said pair of bit lines to a second voltage lower than said first voltage, a pair of first switch elements having current paths connected between said pair of bit lines and a common node, respectively, a capacitor having a first end coupled to said common node and a second end, means for enabling said first switch elements simultaneously in response to a first control signal which is activated after said pair of bit lines are amplified by said sense amplifier thereby to place said pair of bit lines at a third voltage between said first and second voltages, a second switch element having a current path connected between said common node and a voltage terminal set approximately at said second voltage, a first delay circuit, means for applying a second control signal to an input end of said first delay circuit, said second control signal being opposite to said first control signal, a second delay circuit having an output end connected to said second end of said capacitor, means for connecting an output end of said first delay circuit to an input end of said second delay circuit, and gate means having a first input end coupled to the output end of said first delay circuit and a second input end receiving a third control signal, said third control signal being activated

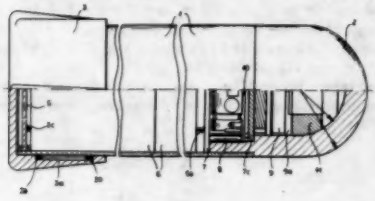
when said pair of bit lines are amplified, said gate means rendering said second switch element conductive when both of said first and second input ends of said gate means are activated.

4,943,953

DEVICE FOR DRIVING RODENTS FROM SUBTERRANEAN BURROWS

Foroud Kafi, Felix-Dahn-Str.64, 1190 Vienna, Austria

Filed Jun. 12, 1984, Ser. No. 597,447
Claims priority, application Austria, Apr. 6, 1983, 1212/83
Int. Cl.[5] H04B *1/02*
U.S. Cl. 367—139 9 Claims



1. A device for driving rodents from burrows in a ground site which comprises:

an elongated housing having at least a thin wall portion and a construction enabling said housing to be driven into the ground;

a shock generator in said housing for generating nonaudible damped vibration compression waves at spaced-apart intervals and transmitting same to a wall of said housing;

means for controlling said shock generator in said housing, said housing having the configuration of a cylinder and is provided with a shell at the end thereof adapted to be driven into the ground, said shock generator being provided in this shell at said end; and

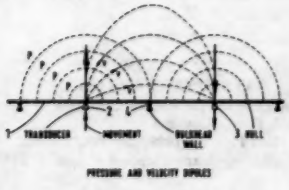
an electric current source in said housing connected to said shock generator.

4,943,954

METHOD AND A SYSTEM FOR COUNTERACTING MARINE BIOLOGIC FOULING OF A HULL OR A SUBMERGED CONSTRUCTION

Lars S. Ostlie, Sandnes, Norway, assignor to Infrawave A/S, Sandnes, Norway

Filed May 26, 1989, Ser. No. 357,398
Int. Cl.[5] H04B *11/00*; B63B *59/00*
U.S. Cl. 367—191 10 Claims



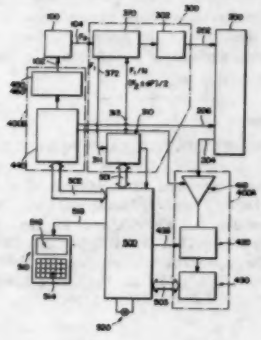
1. Method for combating marine fouling on the outside of a construction submerged in water including a ship hull in which method is utilized a number of electro-mechanical vibration transducers (2, 3) mounted on the inside of such structure (1), said transducers (2, 3) applying mechanical, low frequency vibrations to the structure (1) itself when electrical drive energy is applied to said transducers, and in which method a subsystem generates and feeds electrical drive voltages to said transducers. characterized in that said transducers (2, 3), being arranged in pairs in such a manner that each transducer in one pair is situated at a predetermined distance from and on respective sides of a fixed nodal line (4) on said structure (1), are supplied with drive voltages having such a variation over time that a particle velocity vector field is imparted to the water outside such structure in which the vector field is parallel to the surface of the structure immediately outside said nodal line and has a maximized numerical value in the same area.

4,943,955

ATOMIC CLOCK

Jean Rabian, Sainte Luce/Loire; Jean-Claude Potet, Suce/Erdre, and Michel Buchou, St. Mars Du Desert, all of France, assignors to Societe D'Etudes, Recherches et Constructions Electroniques - Sercel, Carquefou, France

Filed Mar. 2, 1989, Ser. No. 317,962
Claims priority, application France, Mar. 3, 1988, 88 02706
Int. Cl.[5] G04C *15/00*; H03L *7/26*
U.S. Cl. 368—156 32 Claims



1. An atomic clock of the type comprising:

a quartz oscillator,

a tube containing a material, the atoms of which have a hyperfine spectral transition;

control means capable of generating, from the quartz oscillator, a control signal of a frequency that corresponds to the hyperfine spectral transition, and of applying this control signal to the tube to cause interaction between this signal and the atoms of the material contained in the tube; and

feedback means that are sensitive for the response of the tube and are adapted to modifying the frequency of the quartz oscillator so as to substantially center the frequency of the control signal on the frequency of the hyperfine spectral transition,

wherein the control means are adapted for cyclically generating test signals, the controlled frequency of which is located outside the Ramsey peak.

4,943,956

DRIVING APPARATUS

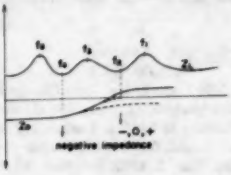
Masao Noro, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Apr. 19, 1989, Ser. No. 340,553
Claims priority, application Japan, Apr. 25, 1988, 63-100215; Apr. 25, 1988, 63-100216; May 25, 1988, 63-125638
Int. Cl.[5] H04R *3/00*
U.S. Cl. 367—137 19 Claims

9. A combined speaker and amplifier system comprising:

a speaker including a cabinet having an outer wall and an internal volume, a partition dividing the internal volume

into at least first and second chambers, the partition having an opening, a first opening in the cabinet outer wall communicating with the first chamber, a second opening in the cabinet wall communicating with the second chamber, and a vibrator located in the opening of the partition, the chambers defining first and second resonators both of



which are driven by the vibrator, the speaker including a plurality of resonance points; and

an amplifier providing a drive signal for driving the speaker, the amplifier having an output impedance which is negative at at least one of the resonance points and having different values of output impedance at at least two of of the resonance points.

4,943,957

HIGH-DENSITY INFORMATION RECORDING CARRIER

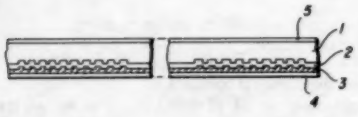
Masaru Sato, and Nagayoshi Tsukane, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 874,963, Jun. 16, 1986, abandoned. This application Oct. 17, 1988, Ser. No. 259,495

Claims priority, application Japan, Jun. 18, 1985, 60-132146; Jun. 18, 1985, 60-132147; Jun. 18, 1985, 60-132148

Int. Cl.[5] G11B *5/66*

U.S. Cl. 428—694 **5 Claims**



1. An optical information recording carrier comprising a transparent plastic substrate, an information recording layer formed on the substrate, and a layer of inorganic glass interposed between the substrate and the recording layer; the recording layer being a magneto-optical rare earth-transition metal amorphous alloy, and said layer of inorganic glass having a thickness of from 100 to 2000 Angstroms and being a glass comprising oxides and having an alkali metal content of less than 1 wt% in terms of alkali metal oxides and a coefficient of linear expansion of 40 to 70×10^{-7}/° C., and containing from 20 wt% to 35 wt% of alkaline earth metals in terms of alkaline earth metal oxides.

4,943,958

ISDN INTERFACE TRUNK CIRCUIT

John S. Young, Scottsdale; Peter Kruis, Glendale, and William D. Blewitt, Phoenix, all of Ariz., assignors to AG Communication Systems Corporation, Phoenix, Ariz.

Filed May 1, 1987, Ser. No. 44,858

Int. Cl.[5] H04J *3/00*

U.S. Cl. 370—77 **20 Claims**

1. An interface trunk circuit for use in receiving and transmitting data between T-carrier facilities and ISDN systems, said interface trunk circuit being connected between said T-carrier facilities and said ISDN systems, said interface trunk circuit comprising:

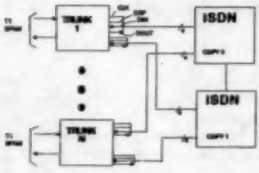
first means for receiving data connected to said ISDN system, said first means for receiving being operated in response to a first serial input data stream received via a data input lead to produce a first parallel data stream;

memory means connected to said first means for receiving and being operated to store said first parallel data stream;

processor means connected to said memory means, said processor means being operated in response to said first parallel data stream to convert logic zero data streams of a predetermined length into logic non-zero data streams of said predetermined length;

first means for transmitting data connected to said memory means, said first means for transmitting being operated in response to said previously stored logic non-zero data stream to convert said non-zero data stream to a first serial output data stream and to transmit said first serial output data stream via said T-carrier facilities;

second means for receiving data connected to said T-carrier facilities, said second means for receiving being operated



in response to a second serial input data stream of said T-carrier facilities to receive said second serial input data stream and to convert said second serial input data stream to a second parallel data stream;

said memory means being connected to said second means for receiving and being operated in response to a receive timing signal of said second means for receiving to store said second parallel data stream simultaneously with said storage of said first parallel data stream and simultaneously with said transmission of said logic non-zero data stream;

said processor means being further operated in response to said second parallel data stream to convert logic non-zero data streams of said second parallel data stream to logic zero data streams for storage in said memory means; and

second means for transmitting data connected to said memory means and to said ISDN systems, said second means for transmitting being operated to convert said second parallel data stream having said logic zero data streams to a second serial output data stream and to transmit said second serial output data stream to said ISDN systems via a data output lead.

4,943,959

DATA PACKET SWITCHING

John S. Arnold, Northants, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Feb. 10, 1989, Ser. No. 308,520

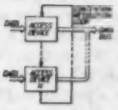
Claims priority, application United Kingdom, Feb. 10, 1988, 8802999

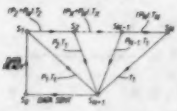
Int. Cl.[5] H04J *3/26*

U.S. Cl. 370—85.5 **5 Claims**

1. A data packet switching arrangement for switching data pockets into a transmission pathway including means arranged to determine data packet priority in each of a plurality of contending input ports and assign priority tokens indicative of the data packet's relative priority, each contending input port being coupled to other contending input ports to form a contention path, said contention path being arranged to allow said priority tokens to be looped through each of said contending

input ports, there being a distinctive priority token indicative of each relative level of priority, said distinctive priority token being seized and held by one contending input port when said one contending input port contains a data packets of said level of priority awaiting transmission, said distinctive priority tokens of higher level being arranged to be seized when these





higher priority level tokens have been looped around said contention path and held when the data packet is transmitted and where tokens of lower priority which may arrive before completion in any transmission sequence and after the first token is seized, are also seized and held and where, on completion, all tokens held are released together.

4,943,960

SELF-REFRESHING OF DYNAMIC RANDOM ACCESS MEMORY DEVICE AND OPERATING METHOD THEREFOR

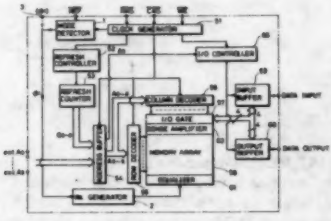
Takahiro Komatsu; Masaki Kumanoya; Katsumi Dosaka, and Yasuhiro Konishi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 337,976

Claims priority, application Japan, Jul. 19, 1988, 63-179890

Int. Cl.[5] G11C *8/00, 11/24*

U.S. Cl. 365—222 **10 Claims**



1. A dynamic random access memory device having normal read, write and refresh modes of operation and an additional self-controlled periodic refresh mode of operation comprising:

a pair of first and second bit lines;

at least one memory cell connected to said first bit line, said memory cell having a capacitor element for storing a data signal, the voltage level of said data signal stored in said capacitor element having a tendency to change toward a ground potential;

input means for receiving externally applied mode select signal for selecting one of said normal operating modes or said additional self-controlled refresh mode;

precharge voltage generator means for generating a first level voltage between a supply voltage and a ground potential for precharging said bit line pair;

equalizing means connected to said precharge voltage generating means for equalizing said bit line pair to said first level voltage in response to said mode select signal applied to said input means for selecting one of said normal operating modes;

said precharge voltage generator means generating a second level voltage between said first level voltage and said ground potential for precharging said bit line pair,

said equalizing means equalizing said bit line pair to said second level voltage in response to said mode select signal applied to said input means for selecting said additional self-controlled mode of operation,

means for receiving an address signal for designating said memory cell;

said memory cell further including means for transferring the data signal stored in said capacitor element in said memory cell to said first bit line in response to the address signal applied to said address signal receiving means; and

sense amplifier means connected between said first and second bit lines for amplifying a potential difference therebetween.

4,943,961

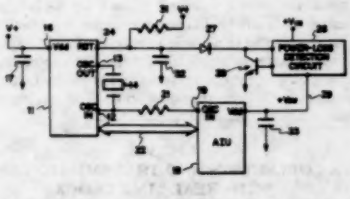
MEMORY RETENTION SYSTEM FOR VOLATILE MEMORY DEVICES

Bradley A. Sparks, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed May 5, 1988, Ser. No. 190,437

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—228 **11 Claims**



3. A memory retention system for an electronic apparatus including first and second logic devices clocked by a common oscillator integrally associated with one of said logic devices, each of said logic devices including an oscillator input terminal having a high impedance when said logic devices receive a biasing voltage and a low impedance when said biasing voltage falls below an acceptable level, at least one of said logic devices including a memory, the memory of said first logic device being volatile whereby stored data is lost when said biasing voltage falls below said acceptable level, said memory retention system including:

charge storage means responsive to said biasing voltage and associated with said first logic device which includes said volatile memory, for retaining a voltage on said volatile memory for a preselected time after said biasing voltage falls below said acceptable level; and

means for coupling together said oscillator input terminals of said logic devices, said oscillator being stopped by said oscillator input terminal of said second logic device exhibiting said low impedance when said biasing voltage falls below said acceptable level.

4,943,962

NONVOLATILE SEMICONDUCTOR MEMORY HAVING PAGE MODE PROGRAMMING FUNCTION

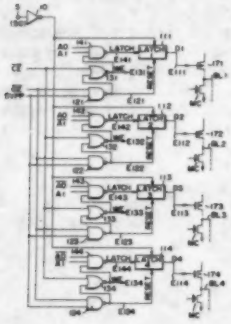
Keniti Imamiya, Yokohama; Sumio Tanaka, Oomorinishi; Junichi Miyamoto, Yokohama; Shigeru Atsumi, Tokyo; Nobuaki Obtsuka, and Shinji Saito, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 28, 1988, Ser. No. 263,752

Claims priority, application Japan, Oct. 30, 1987, 62-275462

Int. Cl.[5] G11C *11/40*

U.S. Cl. 365—230.08 **19 Claims**



1. A nonvolatile semiconductor memory having programming control transistors for controlling data programming into memory cells and receiving input data, address input, chip enable signal, output enable signal, and programming power source voltage, comprising:

set signal generating means for generating set signals in response to the chip enable signal set to be active and the address input when the programming power source voltage is at a preset programming voltage and the output enable signal is inactive; and

latch circuit means, coupled to said set signal generating means, for latching, in response to the set signal, the input data and at the same time supply the latched data to said programming control transistors corresponding to the address input, thus programming the latched data into said memory cells corresponding to the address input.

4,943,963

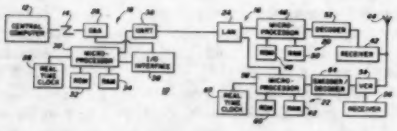
DATA COLLECTION AND TRANSMISSION SYSTEM WITH REAL TIME CLOCK

Jerome R. Waechter, Clearwater; James T. Patten, St. Petersburg, and Paul C. Kempter, Palm Harbor, all of Fla., assignors to A. C. Nielsen Company, Northbrook, Ill.

Filed Jan. 19, 1988, Ser. No. 145,259

Int. Cl.[5] H04H *9/00*

U.S. Cl. 370—94.1 **42 Claims**



1. A data collection and transmission system comprising:

at least one remotely located monitoring station for collecting and storing predetermined operational data;

a central computer arranged for bidirectional communication with said monitoring station and for processing said stored predetermined operational data;

said at least one remotely located monitoring station including a storage and forward unit for communicating with said central computer and having a real time clock, at least one sensor unit for monitoring and storing predetermined operational data and a local area network connecting said storage and forward unit and each of said sensor units; and

said at least one sensor unit including means for receiving a real time coded message from said storage and forward unit, and means responsive to said received real time coded message for determining a current time value, said current time value determining means including means for identifying a transmission time delay over said local area network, and means responsive to said identified transmission time delay for adjusting said real time coded message.

4,943,964

PCM SIGNAL REPRODUCING DEVICE

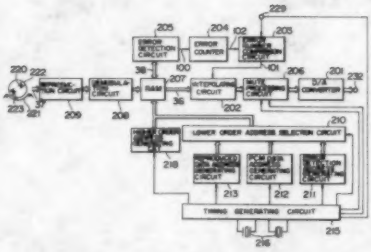
Yuji Hatanaka; Hiroo Okamoto, both of Yokohama; Shin-ichi Wakumura; Ichiro Miyake, both of Tokorozawa, and Shunichiro Sakamoto, Kawagoe, all of Japan, assignors to Hitachi, Ltd. and Pioneer Electric Corporation, both of Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,415

Claims priority, application Japan, Aug. 12, 1987, 62-199870; Aug. 20, 1987, 62-205041

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—31 **13 Claims**



1. A PCM signal reproducing device for reproducing a recording medium having reproduction heads and a plurality of tracks, at least a set of a first and a second track forming one frame, on which PCM data of a first and a second channel respectively divided into odd number data and even number data are recorded, said device comprising:

a signal processing circuit including:

a memory circuit for storing the PCM data reproduced from the reproduction heads;

an error detection circuit for detecting errors of the PCM data stored by said memory circuit;

an error count circuit for counting the number of errors detected by said error detection circuit;

an error comparison circuit for comparing the errors of the odd number data and the even number data of the first and second channels; and

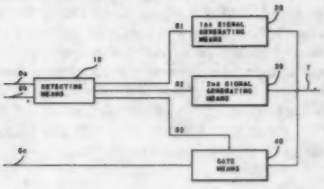
an interpolating circuit connected to receive the PCM data from said memory circuit and replacing with interpolating data the data which is decided to have a larger number of errors in accordance with the comparison.

4,943,965

DIGITAL SIGNAL DECODING METHOD AND CIRCUIT THEREFOR

Hirohisa Machida, and Takeo Nakabayashi, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1988, Ser. No. 217,585
Claims priority, application Japan, Dec. 22, 1987, 62-324408
Int. Cl.[5] G06F *11/16*
U.S. Cl. 371—36 7 Claims



1. A method for decoding an encoded 3-bit digital data signal to a 1-bit digital data signal, comprising the steps of:

receiving the encoded 3-bit digital data signal from an external source;

determining whether a first bit of the 3-bit digital data signal is a logical "1";

determining whether a second bit of the 3-bit digital data signal is a logical "1";

setting the 1-bit digital data signal to a "1" if said first bit and said second bit are both a logical "1";

setting the 1-bit digital data signal to a "0" if said first bit and said second bit are both a logical "0";

decoding a third bit of the 3-bit digital data signal directly if said first bit and said second bit are not both a logical "1" or a logical "0"; and

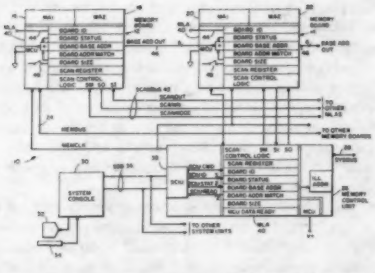
transmitting the 1-bit digital data signal to an external destination.

4,943,966

MEMORY DIAGNOSTIC APPARATUS AND METHOD

Richard F. Giunta, Beverly; Robert D. Becker, Shirley; Martin J. Schwartz, Worcester; Richard W. Coyle, Dunstable, and Kevin H. Curcuru, Pepperell, all of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Apr. 8, 1988, Ser. No. 179,162
Int. Cl.[5] G11C *13/00*; G06F *11/00*
U.S. Cl. 371—11.1 31 Claims



1. Apparatus for allocating memory address base addresses among a plurality of memory units, each of the memory units defining a predefined range of memory addresses, each of the range of memory addresses being contiguous one with the other, comprising for each of the memory units;

means for defining a total number of data storage memory addresses represented by a memory unit, said total number defining means having a first output;

means for defining a portion or portions of said total number of memory unit memory addresses which are disabled from the storage of data therein, said portion defining means having a second output;

means for defining a memory address base address for said memory unit, said base address defining means having a third output;

means for combining said first, said second and said third outputs to produce a fourth output, said fourth output being substantially equal to the sum of said first and said third outputs minus said second output; and

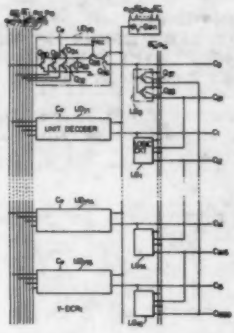
means for outputting said fourth output to another memory unit for defining a memory address base address for the other memory unit.

4,943,967

SEMICONDUCTOR MEMORY WITH AN IMPROVED DUMMY CELL ARRANGEMENT AND WITH A BUILT-IN ERROR CORRECTION CODE CIRCUIT

Takashi Shinoda, and Osamu Saksi, both of Kodaira, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 37,048, Apr. 10, 1987, Pat. No. 4,817,052, which is a continuation of Ser. No. 466,483, Feb. 15, 1983, Pat. No. 4,703,453. This application Mar. 21, 1989, Ser. No. 326,653
Claims priority, application Japan, Feb. 15, 1982, 57-21130
Int. Cl.[5] G06F *11/10*; G11C *29/00*
U.S. Cl. 371—2.2 13 Claims



1. A semiconductor memory comprising:

a plurality of memory cells arranged in a matrix form in one semiconductor chip for storing data;

a selecting circuit coupled to said plurality of memory cells for selecting a plurality of predetermined ones of said plurality of memory cells at a time in response to address signals for reading out a predetermined set of data having check bits from said predetermined ones of said plurality of memory cells; and

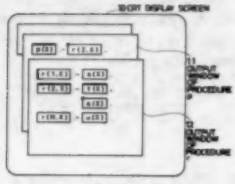
an error correcting code circuit formed in said semiconductor chip and coupled to said selecting circuit to receive said predetermined set of data having check bits from said selecting circuit,

wherein said predetermined ones of the memory cells, for delivering said predetermined set of data having check bits, are located at said semiconductor chip so as to be spaced from each other by a distance of at least one of said memory cells.

4,943,968
METHOD OF DISPLAYING EXECUTION TRACE IN A LOGIC PROGRAMMING LANGUAGE PROCESSING SYSTEM

Tadashi Hirose, Komae; Kazuo Nakao, Sagamihara, and Keiko Shinada, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,459
Claims priority, application Japan, Mar. 4, 1987, 62-47535; Mar. 20, 1987, 62-63993
Int. Cl.[3] G06F *11/00*
U.S. Cl. 371—19 **7 Claims**

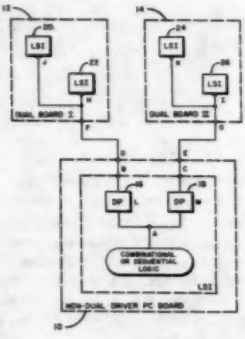


1. A method for displaying an execution trace of a program described in a logic programming language, said program including at least one procedure, the method comprising the steps of:
executing the program in a data processing apparatus;
displaying terms of a program source list of the procedure that is called; and
graphically displaying a present point of execution on the displayed program source list during the execution of the program.

4,943,969
ISOLATION FOR FAILURES OF INPUT SIGNALS SUPPLIED TO DUAL MODULES WHICH ARE CHECKED BY COMPARISON

Peter B. Criswell, Bethel, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Nov. 28, 1988, Ser. No. 277,074
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—68.1 **4 Claims**

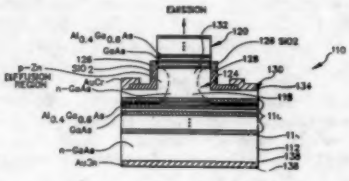


1. A system for detecting and isolating failures of input signals that are supplied to a plurality of identical electronic module means, each of which receives said input signals from a common input means, wherein said module means each comprise
clock means for supplying capture clock phase signals comprising a plurality of capture clock phase signals including a predetermined capture clock phase signal,
a plurality of functional means coupled to said clock means each of which, upon the occurrence of said predetermined capture clock phase signal, captures a functional signal that is derived from an associated input signal,
a plurality of link means coupled to said clock means each of which, upon the occurrence of said predetermined capture clock phase signal which resulted in the capture of an associated functional signal by an associated functional means, captures an input signal from which an associated functional signal was derived and provides a link output signal,
encoding means coupled to said clock means and to a plurality of said link means which, upon the occurrence of one of said capture clock phase signals, provides an encoded signal representative of said link output signal; and
wherein comparison means are coupled to said module means for receiving and for comparing said encoded signals of said plurality of module means and for producing an error signal when said encoded signals of said plurality of module means do not compare.

4,943,970
SURFACE EMITTING LASER

Eric M. Bradley, Escondido, Calif., assignor to General Dynamics Corporation, Electronics Division, San Diego, Calif.

Division of Ser. No. 261,413, Oct. 24, 1988, Pat. No. 4,901,327.
This application Sep. 21, 1989, Ser. No. 410,342
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—45 **14 Claims**



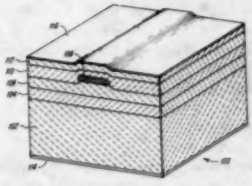
1. A surface emitting laser diode comprising:
a semiconductor substrate having top and bottom surfaces;
a first plurality of alternating semiconductor mirror layers of differing refractive indicies formed upon said substrate;
a semiconductor active layer formed upon said first plurality of semiconductor layers, said active layer having a central region and a surrounding outer region, said active layer central region being of greater thickness than said active layer outer region, wherein said active layer central region has a top and a side surface and said active layer outer region has a top surface intersecting said active layer central region side;
a second plurality of said alternating semiconductor mirror layers formed upon said active central region top surface;
a current confinement layer formed upon said active layer central region side surface and a portion of said active layer outer region top surface immediate said active layer central region side surface;
first and second contacts respectively formed upon said substrate bottom surface and said active layer outer region top surface remote from said active layer central region side surface.

4,943,971

LOW TUNING RATE SINGLE MODE PBTE/PBEUSETE BURIED HETEROSTRUCTURE TUNABLE DIODE LASERS AND ARRAYS

Zeev Fiet, Brookline; Douglas Kostyk, Billerica, and Robert J. Woods, Burlington, all of Mass., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Feb. 24, 1989, Ser. No. 314,977
Int. Cl.[5] H01S 3/29
U.S. Cl. 372—46 6 Claims



1. A buried heterostructure tunable diode laser comprising:
first and second ohmic contacts, and
a resonant cavity comprising first and second parallel faces located between said first and second ohmic contacts and built upon a lead salt substrate, said resonant cavity further comprising a semiconductor monocrystalline lead salt active region layer containing europium and selenium and having a given energy band gap, index of refraction, crystal structure and lattice constant, buried between two semiconductor monocrystalline lead salt layers of mutually opposite conductivity type and having an energy band gap greater than, an index of refraction smaller than, and a lattice constant substantially equal to those of said active region layer.

4,943,972

LASER TUBE

Hans Krueger, Munich, and Wolfgang Welsch, Baldham, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 2, 1988, Ser. No. 265,932
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737626
Int. Cl.[5] H01S 3/08
U.S. Cl. 372—107 9 Claims

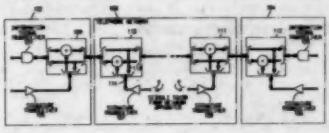
1. A laser tube, comprising:
a tubular housing;
at least one metallic mirror mount composed of an material having a first coefficient of thermal expansion and positioned at an end of said tubular housing;
an integrated mirror on said at least one mirror mount, said integrated mirror having a second coefficient of thermal expansion different than said first coefficient of thermal expansion;
and
a soft solder securing said mirror on said at least one mirror mount.

4,943,973

SPREAD-SPECTRUM IDENTIFICATION SIGNAL FOR COMMUNICATIONS SYSTEM

Jean-Jacques Werner, Holmdel, N.J., assignor to AT&T Company, Murray Hill, N.J.

Filed Mar. 31, 1989, Ser. No. 331,933
Int. Cl.[5] H04K 9/00
U.S. Cl. 375—1 23 Claims



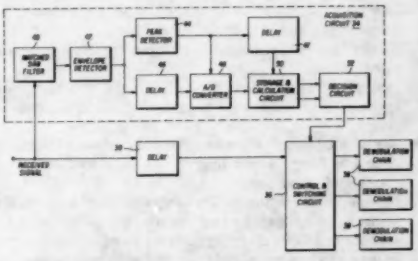
1. A communications system comprising
means for transmitting a spread-specirum signature signal superimposed upon an associated nonspread-spectrum information signal, said spread-spectrum signal conveying information which identifies the associated information signal;
means for receiving said information signal and superimposed spread-spectrum signature signal; and
means responsive to the received spread-spectrum signature signal for recovering the identifying information.

4,943,974

DETECTION OF BURST SIGNAL TRANSMISSIONS

Masoud Motamedi, Gaithersburg, Md., assignor to Geostar Corporation, Washington, D.C.

Filed Oct. 21, 1988, Ser. No. 260,614
Int. Cl.[5] H04K 1/00
U.S. Cl. 375—1 68 Claims



1. A method for detecting a burst signal transmission containing a sequence of N acquisition codes occurring at known time intervals, comprising:
receiving said burst signal transmission and comparing successively received portions thereof to a stored acquisition code pattern;
generating a time-varying correlation output having a magnitude proportional to the similarity between the successively received portions of the burst signal transmission and the stored acquisition code pattern;
detecting and measuring peaks in the magnitude of said correlation output;
forming a group of N peak magnitudes occurring at time intervals corresponding to said known time intervals;

computing values proportional to the mean value and variance, respectively, of the group of N peak magnitudes;
comparing the computed values proportional to the mean value and variance to predetermined minimum and maximum values, respectively; and
indicating the presence of a burst signal transmission when the computed value proportional to the mean value exceeds said minimum value and the computed value proportional to the variance is less than said maximum value.

4,943,975

SPREAD SPECTRUM COMMUNICATION RECEIVER

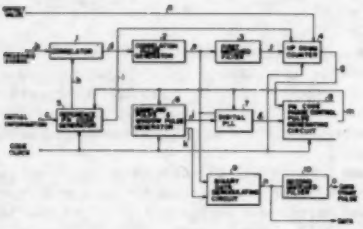
Takao Kurihara; Masahiro Hamatsu, and Masaharu Mori, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 256,394

Claims priority, application Japan, Oct. 9, 1987, 62-255693; Oct. 9, 1987, 62-255694; Oct. 9, 1987, 62-255695; Oct. 30, 1987, 62-275073; Nov. 11, 1987, 62-283056; Nov. 11, 1987, 62-283055

Int. Cl.[5] H04K *1/04*

U.S. Cl. 375—1 **11 Claims**



1. A spread spectrum communication receiver comprising:
correlating means for correlating a received PN code contained in a received signal with a reference PN code contained in a reference signal;
correlation pulse generating means for generating a series of correlation pulses, corresponding to the polarity of a correlation spike outputted by said correlating means;
reference signal generating means for generating said reference signal;
means for generating sampling pulses before and after said correlation pulse in time and extracting a correlation pulse from said series of correlation pulses by using those sampling pulses;
digital phase lock means for holding the synchronization between said received PN code and said reference PN code;
phase control means for controlling the phase of said reference PN code, responding to the output of said digital phase lock means; and
data demodulation means for demodulating said received signal to obtain data by extracting a correlation pulse from said series of correlation pulses by using a window pulse having a time interval between said sampling pulses generated before and after said correlation pulse in time.

4,943,976

SPREAD SPECTRUM COMMUNICATION SYSTEM

Yukinobu Ishigaki, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

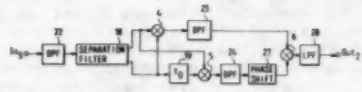
Filed Sep. 13, 1989, Ser. No. 406,408

Claims priority, application Japan, Sep. 16, 1988, 63-233302

Int. Cl.[5] H04K *1/00*

U.S. Cl. 375—1 **5 Claims**

5. A spread spectrum communication system comprising a transmitter and a receiver, the transmitter including:
means for modulating a first carrier with an information signal to generate a first primary modulation signal;
means for adding the first primary modulation signal and a second carrier to generate an addition signal;
means for generating a first spread code and a second spread code in response to a clock signal, the second spread code being equal to the first spread code delayed by a predetermined time;
means for multiplying the addition signal and the first spread code to spread a spectrum of the addition signal with the first spread code to generate a first spread spectrum signal;
means for shifting a phase of the first carrier by a predetermined angle to generate a third carrier;
means for multiplying the third carrier and the second spread code to spread a spectrum of the third carrier with the second spread code to generate a second spread spectrum signal; and
means for adding the first spread spectrum signal and the second spread spectrum signal to generate a composite spread spectrum signal;
the receiver including:
means for separating the composite spread spectrum signal into a third spread spectrum signal and a fourth spread spectrum signal related to a frequency of the first carrier and a frequency of the second carrier respectively;



means for multiplying the third spread spectrum signal and the fourth spread spectrum signal to generate a first despread spectrum signal;
means for delaying the fourth spread spectrum signal by a predetermined time to generate a fifth spread spectrum signal;
means for multiplying the third spread spectrum signal and the fifth spread spectrum signal to generate a second despread spectrum signal;
a first band pass filter filtering the first despread spectrum signal to demodulate a second primary modulation signal, corresponding to the first primary modulation signal, from the first despread spectrum signal;
a second band pass filter filtering the second despread spectrum signal;
means for deriving a carrier component from an output signal of the second band pass filter, the carrier component being synchronous with the second primary modulation signal; and
means for mixing the second primary modulation signal and the carrier component to perform sync demodulation to demodulate the information signal from the second primary modulation signal.

4,943,977

CORRELATION PULSE GENERATING CIRCUIT IN A SPREAD SPECTRUM RECEIVER

Yoshitaka Uchida, and Kouichi Kato, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1989, Ser. No. 376,860

Claims priority, application Japan, Jul. 12, 1988, 63-174224

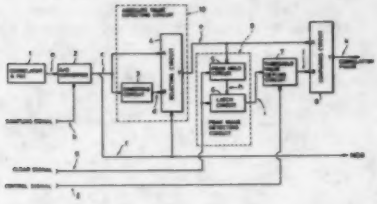
Int. Cl.[5] H01K *1/04;* H04L *9/00*

U.S. Cl. 375—1 **3 Claims**

1. A spread spectrum receiver comprising:
a correlator for generating a correlation spike by correlating a received signal with a reference signal; and
a correlation pulse generating circuit for generating a correlation pulse, responding to said reference signal, including
an A/D converting circuit which A/D-converts said correlation spike;
an absolute value detecting circuit for detecting the absolute value of the output of said A/D converting circuit;

a peak value detecting circuit for detecting the value corresponding to a peak of the output of said absolute value detecting circuit;

a threshold value setting circuit for generating a threshold



signal based on the output of said peak value detecting circuit; and

a comparing circuit for comparing the output of the absolute value detecting circuit with said threshold signal to generate the correlation pulse.

4,943,978

DIGITAL INTERFACE UNIT

Thomas B. Rice, Laguna Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 81,561, Jul. 31, 1987, abandoned, which is a continuation of Ser. No. 802,786, Nov. 27, 1985, abandoned. This application Jan. 17, 1989, Ser. No. 298,293

Int. Cl.[5] H04K *1/102*

U.S. Cl. 375—1 **18 Claims**

6. Digital communication apparatus for use with secure, jam-resistant digital communication equipment, said digital communication equipment having a message protocol which includes a free text message protocol, said digital communication apparatus allowing transfer of data, over said digital communication equipment, between digital communications terminals of a predetermined type having a fixed format message protocol which is incompatible with the message protocol of said digital communication equipment, said digital communication apparatus comprising:

first means, adapted to receive fixed format digital messages having a fixed format message protocol compatible with said communications terminals, for packing said fixed format digital message into free text digital messages having a free text message protocol compatible with the free text message protocol of said jam-resistant digital communication equipment; and

second means adapted to receive free text digital messages compatible with said communication terminal and having a fixed format digital message contained therein, for unpacking said fixed format digital message from said free text digital message to provide said fixed format digital messages for use with said communication terminals.

4,943,979

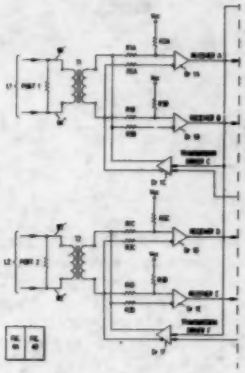
LOCAL ACCESS NETWORK SIGNAL REGENERATOR

Harold H. Webber, Jr., Berkeley, Calif., assignor to Farallon Computing Corporation, Emeryville, Calif.

Filed May 12, 1988, Ser. No. 193,854

Int. Cl.[5] H03K *11/00*; H04L *25/60*

U.S. Cl. 375—4 **5 Claims**



1. In a local access network for facilitating communication between computer products, where the network uses two unshielded wires as a signal line to transport messages between the computer products, a multiport signal regenerator that comprises:

a plurality of substantially identical transformers, with one transformer being associated with and connected to each computer product, with each transformer having two primary terminals and two secondary terminals, with the two primary terminals being connected by two wires of a signal line to the associated computer product in the network;

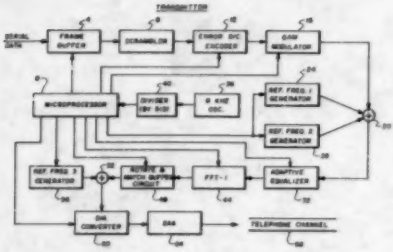
a transceiver circuit connected to the two secondary terminals of each transformer, to receive a message from a source computer product in the network, to transmit a copy of this message to all other computer products in the network, to lock out all other messages received from other computer products while the current message is being received and processed by the circuit, to sense the end of the message being currently received by the circuit, and to re-arm the circuit to receive and process another incoming message at a predetermined idle time interval after the end of the current message is received, where the predetermined idle time is determined by the circuit itself; and

a timing circuit connected to the transceiver circuit, to receive a copy of the current message, to measure the temporal length Δt_m of the current message, to issue a disable command to the transceiver circuit that commands the transceiver circuit to ignore or lock out the remainder of the current message and any subsequent messages received from the source computer product for a predetermined punishment time interval Δt_2 thereafter, if Δt_m exceeds a predetermined protocol time interval Δt_1.

4,943,980
MULTI-CARRIER HIGH SPEED MODEM

W. Kurt Dobson, Salt Lake City, and Donald L. Chaffee, Park City, both of Utah, assignors to Intelligent Modem Corporation, Midvale, Utah

Filed May 2, 1989, Ser. No. 346,069
Int. Cl.[5] H04B *15/00*
U.S. Cl. 375—42 8 Claims



1. A modem system for transmitting digital data information over a telephone channel or the like comprising

means for successively generating sets of carrier signals, each carrier signal of a set having a frequency different from the frequency of every other carrier signal of the set and therefore a frequency spacing therebetween,

means for modulating each carrier signal of a set with a different portion of the digital data, all such portions which are used to modulate a set of carrier signals comprising a frame of digital data,

means for successively combining together the modulated carrier signals of each set to produce a frame waveform,

means for successively transforming each waveform, pursuant to an inverse Fast Fourier Transform function, from a frequency domain signal to a time domain signal,

means for rotating each transformed waveform so that its beginning point and slope substantially matches the ending point and slope of the immediately preceding transformed waveform,

means for successively and continuously transmitting the transformed, rotated waveforms from a transmitting station to a receiving station,

means for receiving the transmitted waveforms,

means for rerotating each received waveform substantially to its original condition before rotating,

means for transforming each received, rerotated waveform, pursuant to a Fast Fourier Transform function, from a time domain signal to a frequency domain signal, and

means for demodulating each received and rerotated waveform to recover the digital data information.

4,943,981
DIVIDING MECHANISMS FOR FREQUENCY SYNTHESIZERS

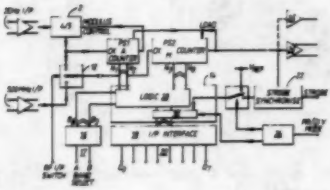
Nicholas P. Cowley, Wiltshire, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Mar. 30, 1989, Ser. No. 330,710
Claims priority, application United Kingdom, Mar. 30, 1988, 8727951
Int. Cl.[5] H03K *21/02*
U.S. Cl. 377—47 6 Claims

1. A dividing mechanism, comprising:

A two modulus divider system having a first and second counter for providing respective programmable count totals A, M, and first counter being coupled to a dual modulus device providing moduli of n and n+1 whereby the two modulus divider system provides a division ratio of (Mn+A) for incoming signals;

first and second input means for receiving first and second programming number signals N, Q, synchronisation means for receiving a strobe signal from a further counter which provides a count total P, and logic interface means responsive to said first and second input means and said synchronisation means to provide programming number

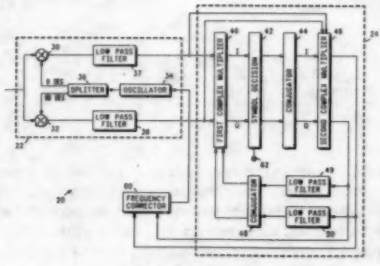


signals, A, M to said two modulus divider system, the logic interface means being such that in the absence of said strobe signal the two modulus divider system provides a count total $C_1=f(N)$, and following the reception of the strobe signal the two modulus divider system provides at least one count cycles with a count total $C_2=f(N,Q)$, whereby if the output of the two modulus divider system is coupled to said external counter, said dividing mechanism provides a count total $C_3=f(P,N,Q)$.

4,943,982
BASEBAND CARRIER PHASE CORRECTOR

Vernon P. O'Neil, II, Tempe, and Jesus A. Navarro, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1989, Ser. No. 345,744
Int. Cl.[5] H03D *3/20*; H04L *27/06*
U.S. Cl. 375—81 6 Claims



1. A carrier phase corrector circuit comprising:

baseband input means for supplying in-phase (I) and quadrature (Q) baseband modulated signals from an input signal having a given frequency and phase;

said I and Q baseband modulated signals each including a respective phase error;

first multiplier means, said first multiplier means coupled to said baseband input means to receive said I and Q baseband modulated signals;

said first multiplier means outputting phase adjusted I and Q baseband signals;

symbol decision means coupled to said first multiplier means to receive said phase adjusted baseband I and Q signals from said first multiplier;

said symbol decision means for estimating digital I and Q signals corresponding to phase adjusted I and Q baseband signals;

second multiplier means coupled to said symbol decision means to receive said digital I and Q signals, and further coupled to said baseband input means to receive said I and Q baseband modulated signals;

said second multiplier means for generating a conjugated phase error from said digital I and Q signals and said I and Q baseband modulated signals;

said first multiplier means coupled to said second multiplier means to receive said conjugated phase error;

said first multiplier means for adjusting the phase error of said I and Q baseband modulated signals by said conjugated phase error multiplying with said I and Q baseband modulated signals;

output means coupled to said symbol decision means; and

said output means for outputting said digital I and Q signals when the carrier phase corrector circuit has locked onto said phase of said input signal.

4,943,983

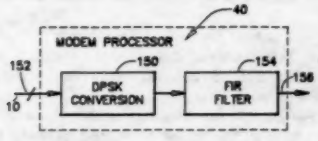
SUBSCRIBER UNIT FOR WIRELESS DIGITAL TELEPHONE SYSTEM

David N. Critchlow, San Diego, Calif., assignor to International Mobile Machines Corporation, Philadelphia, Pa.

Continuation of Ser. No. 893,916, Aug. 7, 1986, Pat. No. 4,825,448. This application Oct. 12, 1988, Ser. No. 256,580

Int. Cl.[5] H04L *27/18*

U.S. Cl. 375—84 **1 Claim**



1. A modem comprising

a modem processor including a DPSK converter coupled to a filter;

said converter having a digital bit input and comprising an inverse Gray coding function whose output is applied to a phase quantizer for determining the absolute value of the current symbol, said quantizer being coupled to a differential encoder for providing a differentially encoded phase value that represents the modulo sum of the current differential phase and the prior absolute phase, said modulo sum being directly applied to form the I and Q of the current symbol; and

said filter being adapted to create an oversampled PSK waveform from said I and Q components that provide a time division multiplexed signal.

4,943,984

DATA PROCESSING SYSTEM PARALLEL DATA BUS HAVING A SINGLE OSCILLATOR CLOCKING APPARATUS

Gerald G. Pechanek; David J. Shippy, both of Endwell; Mark C. Snedaker, Vestal, and Sandra S. Woodward, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 24, 1988, Ser. No. 211,032

Int. Cl.[5] H04L *7/00*; G06F *1/04*; H04Q *9/04*

U.S. Cl. 375—109 **22 Claims**

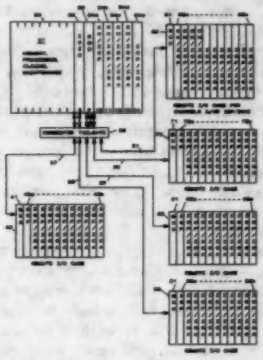
1. A clock system including a parallel data bus suitable for use in the transfer of data among units of a data processing system comprising:

a. a source of clock pulses in a first of said units;

b. parallel data bus means connecting said first unit with other of said units;

c. first data transfer logic in said first unit connected to said source of clock pulses and said data bus for transferring data and said clock pulses to said other units; and

d. second transfer logic in each of said other units for receiving said transferred data and clock pulses and for transferring data and said received clock pulses to said first unit whereby said source of clock pulses is used to control the transmission of data at said first unit and said other units.



4,943,985

FRAME SYNCHRONIZATION DEVICE FOR A SYNCHRONOUS DIGITAL BIT STREAM DIVIDED INTO BLOCKS BY MEANS OF A BLOCK CODE AND STRUCTURED IN FRAMES

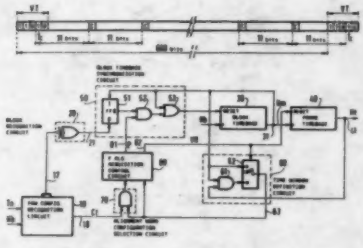
Bernard Gherardi, Lisses, France, assignor to Societe Anonyme dite: Alcatel CIT, Paris, France

Filed May 17, 1989, Ser. No. 353,367

Claims priority, application France, May 18, 1988, 88 06642

Int. Cl.[5] H04L *7/08*

U.S. Cl. 375—111 **2 Claims**



1. A frame synchronization device for a synchronous digital bit stream divided into data blocks at a block timing rate by means of a block code and structured in frames occurring at a frame timing rate marked by alignment words having a predetermined configuration, said device comprising:

an alignment word configuration recognition circuit for detecting said predetermined configuration in said digital bit stream and for generating a configuration recognition signal each time said predetermined configuration is detected,

a frame timebase for delivering a clock signal at the frame timing rate,

a block recognition circuit for generating block recognition signals corresponding to possible locations in the digital bit stream of transitions between data blocks,

a block timebase for delivering a block clock signal at the block timing rate,

a synchronizing circuit responsive to said block recognition signals for synchronizing said block timebase,

a time window definition circuit responsive to signals from said block timebase and said frame timebase for producing time window signals defining alignment word configuration search time windows occupying positions relative to said blocks which correspond to the position of a configuration recognition signal sent by said configuration recognition circuit upon detecting an alignment word,

an alignment word configuration selection circuit responsive to configuration signals from said alignment word configuration recognition circuit and responsive to said time window signals for selecting configuration recognition signals coinciding with said configuration search time windows, and

an alignment word acquisition control circuit responsive to an output of said configuration selection circuit for causing said time window definition circuit to generate time windows at the block clock timing rate in the absence of selection signal output over multiple consecutive frames, and which, upon the occurrence of a selection signal output synchronizes said frame timebase to the occurrence of the selected configuration and commands said time window definition circuit to generate time window signals at the frame clock timing rate.

4,943,986

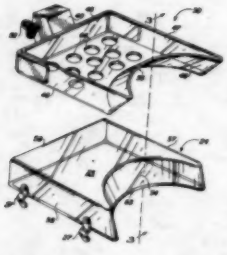
MAMMOGRAPHY COMPRESSION APPARATUS FOR PROSTHETICALLY AUGMENTED BREAST

Leonard Barbarisi, 2034 E. Sourthern, Ste. D, Tempe, Ariz. 85282

Filed Oct. 27, 1988, Ser. No. 263,520

Int. Cl.[5] A61B *6/04*

U.S. Cl. 378—37 **12 Claims**



1. In a mammographic device for examination of a patient having an augmentation prosthesis, said device having an X-ray source for emitting X-ray radiation along a predetermined path to expose an X-ray film and including a breast-support table positioned in said path, the improvement comprising a first compression plate disposed in said X-ray path above said support table and selectively movable relative to said support table to compress the breast during examination, said compression plate having a first generally planar compression surface adapted to engage the breast with an anterior edge of the plate positioned adjacent the patient, said anterior edge defining a relieved area generally shaped and adapted to compress substantially only breast tissue and to exclude the said prosthesis during compression and examination.

4,943,987

METHOD AND SYSTEM FOR DISPLAYING X-RAY IMAGES OF BLOOD-VESSEL STRUCTURE PARTS OF SUBJECT

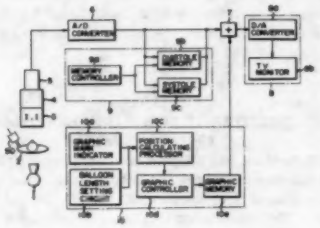
Hiroshi Asahina, Tochigi, and Ichiro Ogura, Ootawara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 228,157, Aug. 4, 1988, abandoned. This application Nov. 1, 1989, Ser. No. 430,964

Claims priority, application Japan, Aug. 7, 1987, 62-198422; Aug. 7, 1987, 62-198423

Int. Cl.[5] H04N *5/32*

U.S. Cl. 378—99 **9 Claims**



1. A method for generating and displaying X-ray images of a region of interest of a subject, the method comprising the steps of:

injecting a contrast media into the subject;

acquiring X-ray contrast images of the region of interest of the subject after the contrast media reaches the region of interest of the subject;

generating graphic line data representing a locus of changing position of the region of interest by using the X-ray contrast images;

acquiring X-ray images in the region of interest of the subject;

superimposing the graphic line data on X-ray images to obtain X-ray superimposition images; and

displaying the X-ray superimposition images.

4,943,988

X-RAY DIAGNOSTICS INSTALLATION HAVING AN IMAGE INTENSIFIER VIDEO CHAIN

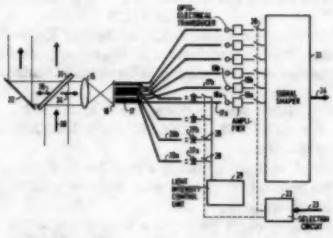
Hans-Juergen Gerlach, Erlangen, and Horst Aichinger, Fuerth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 26, 1989, Ser. No. 426,977

Claims priority, application European Pat. Off., Dec. 2, 1988, 88120176.8

Int. Cl.[5] H05G *1/44*

U.S. Cl. 378—108 **2 Claims**



1. An x-ray diagnostics installation comprising:

means adapted for exposing an examination subject to a dose of x-radiation;

an x-ray image intensifier having an input screen on which x-radiation attenuated by said examination subject is incident and an output screen which generates a light image in a light beam path corresponding to the incident x-radiation;

video pick-up means disposed in said light beam path for converting said light images into electrical signals;

video processing and display means connected to said video pick-up means for generating a video image from said electrical signals corresponding to said light image;

first fiber optics consisting of a plurality of light waveguides having an input end disposed for receiving light in said light beam path, and having an output end;

a plurality of opto-electrical transducers disposed at said output end of said first fiber optics and respectively associated with said light waveguides;

switching means for selectively activating said plurality of opto-electrical transducers in a pattern corresponding to a region of primary medical interest within said light image for obtaining a signal corresponding to the average brightness in said region of primary medical interest;

means for controlling the dose of x-radiation from said means for exposing based on said average image brightness;

a plurality of electro-optical transducers also selectively activated by said switching means in said pattern, so that said electro-optical transducers in combination form a light image of said region of primary medical interest; and

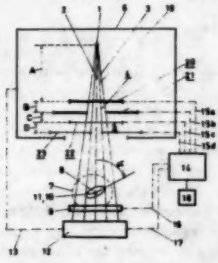
second fiber optics in optical communication with said electro-optical transducers for back-projecting said light image of said region of primary medical interest into said light beam path for inclusion in said video image.

4,943,989

X-RAY TUBE WITH LIQUID COOLED HEAT RECEPTOR

Brian D. Lounsberry, Brookfield, and Krystyna Truszkowska, Shorewood, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Aug. 2, 1988, Ser. No. 227,280
Int. Cl.[5] H01J *35/10*
U.S. Cl. 378—130 **1 Claim**



1. In an x-ray tube having an envelope which contains a cathode that emits electrons, and a rotating anode which includes a target surface against which the electrons impinge to produce x-rays, the improvement therein comprising:

an emissive anode surface formed on the exterior of the rotating anode to enhance the radiation of thermal energy therefrom;

a stationary receptor mounted to the envelope and having an emission receptor surface which is positioned in facing relation and in close proximity to the emissive anode surface on the exterior of the rotating anode; and

a fluid chamber formed in the stationary receptor for receiving a cooling fluid that removes heat from the stationary receptor;

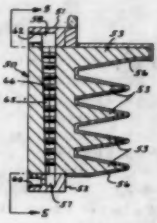
the stationary receptor including a plurality of pins which are formed of a heat conductive material and which extend across the fluid chamber and in the path of the cooling fluid.

4,943,990

THERAPY SIMULATOR

Hugo Schär, Flaach, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Dec. 6, 1988, Ser. No. 280,499
Claims priority, application Switzerland, Dec. 11, 1987, 4846/87
Int. Cl.[5] G21K *1/03*
U.S. Cl. 378—152 **6 Claims**



1. A therapy simulator comprising:

a radiator head having a radiation source,

an image acquisition unit connected to said radiator head having means for swiveling said image acquisition unit along with said radiator head around a swivel axis,

an adjustable patient's couch movable between said radiator head and said image acquisition unit,

first and second diaphragm systems arranged in said radiator head such that said first and second diaphragm systems are offset in the direction of a principal axis of said radiation source, said first and second diaphragm systems having actuating elements capable of moving said first and second diaphragm systems at substantially the same speed, wherein

at least one of said first and second diaphragm systems is comprised of at least four diaphragms situated opposite each other to form two diaphragm pairs,

each of said two diaphragm pairs being arranged at substantially a 90° angle with respect to each other and in substantially adjacent planes,

said first diaphragm system having at least one diaphragm linkable to at least one diaphragm of said second diaphragm system, and

said linked diaphragms jointly movable in the same direction,

each of said four diaphragms being movable by means of at least two corresponding driving spindles, each of said at least two spindles being threadably engaged in a diaphragm holder, each of said at least two spindles having a thread pitch that is proportional to the distance of the corresponding diaphragm from said radiation source, and

each of said four diaphragms being provided with said at least two driving spindles such that at least four driving spindles are provided for each diaphragm pair, said at least four driving spindles being positioned parallel to one another in a plane, and each of said four diaphragms having at least two diaphragm holders being guided by said at least two driving spindles.

4,943,991
CONTOURED IMAGING SYSTEM

Richard A. Mosby, 3622 S. Braeswood, Houston, Tex. 77025

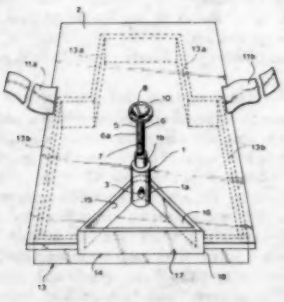
Continuation-in-part of Ser. No. 155,708, Feb. 16, 1988. This application May 9, 1988, Ser. No. 191,903
The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.
Int. Cl.[5] G03B *42/04*
U.S. Cl. 378—182 11 Claims

1. An X-ray imaging system comprising,
a source means for generating X-rays for examination of the interior of objects and spaced from the object to be examined, and
an X-ray film cassette positioned on the other side of the object to be examined for detection of X-rays transmitted from said source means through the object to be examined,
said cassette being a box of a material permitting transmission of X-rays from said source means,
said box having an edge wall portion with a concave contour for receiving an image fixing medium having the same concave contour,
an X-ray film positioned removably inside said box having a contour fitting the inside of said contoured edge wall,
said contoured edge of said box being shaped to fit around the surface of an object adjacent to the portion of the object to be subjected to detectable energy to position the image fixing medium therein more closely in line with the energy being transmitted thereto, and
said source means including means to contour an X-ray beam therefrom to pass only through the portion of the object being examined to reach said image fixing medium adjacent to the contoured edge thereof.

4,943,992
PEDIATRIC X-RAY POST

Joseph F. Caccavo, 31 West Boulevard, East Rockaway, N.Y. 11518

Filed Aug. 18, 1988, Ser. No. 233,223
Int. Cl.[5] H05G *1/00*
U.S. Cl. 378—208 7 Claims

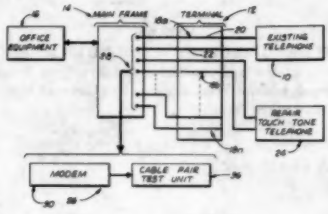


1. Apparatus for immobilizing and protecting a child during an X-ray examination comprising (a) a horizontal flat platform to support said child, said platform being made of an X-ray transparent material and having a frame extending beneath its lower surface to retain an X-ray film cassette, (b) a pediatric post for straddling by said child, said post being securely held normal to the upper surface of said platform and (c) a lead shield supported by an arm extending laterally from said post, said arm having a longitudinal slot and being held at the upper end of said post by a threaded fastener extending through said for positioning said shield between a source of X-ray radiation and the gonads of said child.

4,943,993
CABLE PAIR TESTER

Don C. Fore, 324 N. Brown, Vinita, Okla. 74301

Continuation of Ser. No. 156,909, Feb. 17, 1988, Pat. No. 4,864,597. This application Sep. 5, 1989, Ser. No. 403,294
The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.
Int. Cl.[5] H04M *1/24, 3/46*
U.S. Cl. 379—6 8 Claims

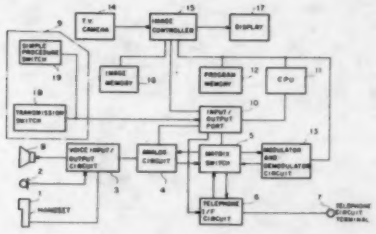


1. An apparatus adapted for use with a plurality of cable pairs for placing a test condition of connecting an existing telephone number to a selected cable pair, comprising:
a cable pair tester having a portion connected to each of the plurality of cable pairs with electrical continuity being interrupted between the cable pairs and the cable pair tester, the cable pair tester establishing electrical continuity between a selected one of the cable pairs and the cable pair tester in response to receiving a cable pair command code uniquely identifying the selected cable pair, and the cable pair tester placing the test condition on the selected cable pair in response to receiving the test condition command code comprising:
an auxiliary telephone network adapted to connect an existing telephone number to the selected cable pair in response to receiving the test condition command code uniquely identifying the test condition of connecting the existing telephone number to the selected cable pair, the existing telephone number being connected to the selected cable pair in response to receiving the test condition command code uniquely identifying the test condition of connecting the existing telephone number to the selected cable pair; and
means remote from the cable pair tester for supplying the cable pair command code and the test condition command code.

4,943,994
STILL PICTURE PICTUREPHONE COMMUNICATIONS SYSTEM

Hiroshi Obtsuka, and Yutaka Ueno, both of Kanagawa, Japan, Lawrence D. Emmons; James S. Mackley, both of Grass Valley City, Calif., assignors to Luma Telecom Incorporated, Santa Clara, Calif. and Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 263,892
Claims priority, application Japan, Oct. 30, 1987, 62-274819; Oct. 30, 1987, 62-274820; Oct. 30, 1987, 62-274821; Oct. 30, 1987, 62-274822; Nov. 6, 1987, 62-280542
Int. Cl.[5] H04N 7/14
U.S. Cl. 379—53 8 Claims



1. A method of operating a still picture picturephone communication system for transmitting and receiving a still picture over a telephone circuit including a handshaking process wherein prior to still picture transmission, identification code data indicating a function of picturephone sets and including a divided number of pixels per one frame of a still picture is sent and received, matching of the function of equipment of a calling party with the function of equipment of a called party is achieved, and decision is made as to whether the still picture is being transmitted or not, comprising

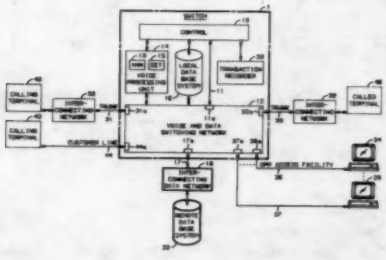
forming desired response waiting time data within said identification code data; and

in said handshaking process, sending out response data including identification code data or still picture data delayed by a period of time corresponding to said response waiting time data within the identification code data received from the called party.

4,943,995
SEMI-AUTOMATED CUSTOMER INFORMATION SYSTEM

Abraham N. Daudelin, Colts Neck; Ronald J. Hartnett, Middletown, and William A. O'Connell, Bricktown, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 8, 1986, Ser. No. 916,614
Int. Cl.[5] H04M 3/58, 3/50
U.S. Cl. 379—67 14 Claims



1. A method of providing information to a telecommunications customer at a customer station in a telecommunications system comprising a switch including a voice processing unit, said voice processing unit also adapted to detect signals keyed on a customer station, comprising the steps of:

dialing a directory number from a customer station, said directory number used for accessing attendants;

setting up a first call connection from said customer station to a first attendant position selected from a first group of attendant positions;

responsive to an information request received over said first call connection, selecting one of a plurality of prerecorded messages, at least one of said plurality of messages comprising a prompting message specifying a customer command to be generated at said customer station;

transmitting said selected prerecorded message to said customer station;

the method CHARACTERIZED IN THAT it includes the additional steps of:

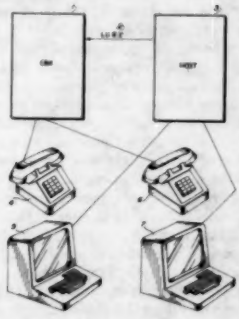
after the beginning of the transmitting step detecting a customer command transmitted from said customer station, by said voice processing unit, wherein said customer commands comprise spoken commands and signals keyed on a customer station;

in response to detection of a first customer command, setting up a second call connection in said switch between said customer station and a telecommunications terminal serving a vendor, and billing said vendor for said second call connection.

4,943,996
SHARED ACCESS TO VOICE AND INFORMATION

William T. Baker, Jr., Palo Alto; Charles M. Buffum, San Jose; Charles H. Jolissaint, Sunnyvale, and Gregg W. Kerlin, Los Gatos, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 6, 1989, Ser. No. 294,454
The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.
Int. Cl.[5] H04M 3/56, 11/06
U.S. Cl. 379—96 29 Claims



1. Method for conferencing a phone call and information associated with the phone call to a plurality of participants in a system having a plurality of phones managed by a digital switch, a plurality of display terminals, a host processor, and memory means for storing programs and data structures, the digital switch including memory means for storing programs and a data structure for uniquely identifying each phone by an extension, control means for attaching said plurality of phones and communication means for communicating with the host processor, the host processor having memory means for storing a communication manager, data structures and applications programs and communication means for communicating with

the digital switch and the plurality of display terminals, said method comprising the steps of:

(a) sending the host processor a communication in response to a call processing event, said communication containing a source phone extension and a plurality of destination phone extensions;

(b) receiving said communication by the communication manager of the host processor;

(c) processing said communication and determining an associated application program and an associated display terminal to link with each of said plurality of destination phone extensions; and

(d) invoking said associated application program to communicate with said associated display terminals to display information associated with the call processing event.

4,943,997

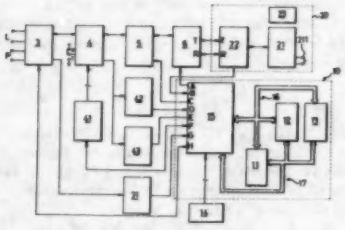
DEVICE FOR COMMUNICATING A DOORSIDE INTERCOM SET WITH A REMOTE TELEPHONE

Mei-Yin Chang, 9 Fl., No. 303, Fu Hsing N. Rd., Taipei, Taiwan

Filed Apr. 14, 1989, Ser. No. 338,215

Int. Cl.[5] H04M *1/26, 11/02*

U.S. Cl. 379—160 **4 Claims**



1. A device for communicating a doorside intercom set having a push button of an intercom system with a selected remote telephone via a cable, comprising a microprocessor with a software and memory means, an input means for inputting the phone number of said selected remote telephone into said memory means, and detecting means to detect the state of said selected remote telephone;

said software being so programmed that when said push button is pushed, said microprocessor will read the phone number from said memory means and send out a corresponding signal via said cable to give a call to said selected remote telephone to build up the communication between said doorside intercom set and said selected remote telephone when said selected remote telephone is detected by said detecting means as not busy, said device further comprising a number changing means for changing the number of said selected remote telephone stored in said memory means, said number changing means being only actuated to receive a new telephone number inputted by dialing from any remote telephone via said cable to said device after a specific password code is inputted by dialing said any remote telephone via said cable to said device.

4,943,998

INTERMESHED COMMUNICATION NETWORK

Uwe Bauer, Eckental, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Filed Apr. 21, 1989, Ser. No. 342,256

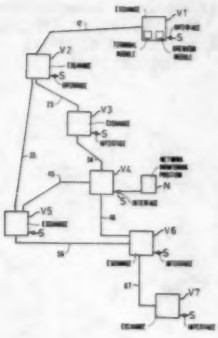
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1988, 3813581

Int. Cl.[5] H04M *7/00*

U.S. Cl. 379—220 **3 Claims**

1. In a communication network of the type comprising a plurality of exchanges, groups of communication lines with each group of communication lines connecting a respective pair of the exchanges for providing communication channels between subscribes at different exchanges, and wherein connection between subscribes at different exchanges is established by forward messages transmitted over all possible groups of communication lines, the improvement comprising:

each of said exchanges comprising a terminal module for storing statistical data about the traffic load of the groups



of lines connected to the respective exchange and operating data of the exchange;

the respective terminal module of each of said exchanges are callable and capable of calling like a subscriber through said exchanges and communication lines of the communication network; and

each of said exchanges comprise an interface for external connection to the terminal module of said exchange.

4,943,999

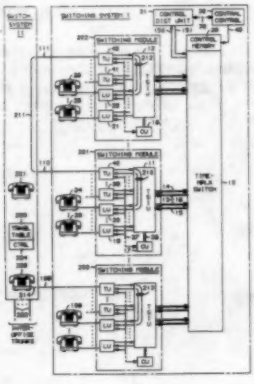
SWITCHING SYSTEM RELIABILITY

Menachem T. Ardon, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 24, 1989, Ser. No. 356,807

Int. Cl.[5] H04M *7/14*

U.S. Cl. 379—221 **16 Claims**



1. In combination:

a first telecommunication switching system comprising a plurality of lines and a plurality of trunks and a central connection arrangement for selectively interconnecting said lines and said trunks;

a second telecommunication switching system connected to said first telecommunication system by a first and a second one of said trunks;

means at said first telecommunication switching system for receiving first call signaling information defining a call destination on said first telecommunication system;

control means in said first switching system and responsive to said first call signaling information for transmitting second call signaling information defining said call destination to said second telecommunication switching system; and

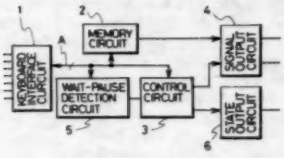
said second telecommunication switching system comprises means responsive to said second call signaling information for connecting said first one of said plurality of trunks to said second one of said plurality of trunks.

4,944,000

SEMICONDUCTOR INTEGRATED CIRCUIT FOR A TELEPHONE DIALER INCLUDING A WAIT-PAUSE CIRCUIT

Yuji Hishiki, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Dec. 12, 1988, Ser. No. 283,162
Claims priority, application Japan, Dec. 15, 1987, 62-316481
Int. Cl.[5] H04M *1/274*
U.S. Cl. 379—359 **7 Claims**



1. A semiconductor integrated circuit for a telephone, comprising:

a keyboard interface circuit for inputting a sequence of telephone directory number data, wait-pause data and additional information number data;

a memory circuit for registering the sequence of data and for outputting the registered sequence of data in response to an operating command inputted through the keyboard interface circuit;

a wait-pause detecting circuit for detecting the wait-pause data included in the outputted sequence of data and producing a corresponding detection signal;

a signal output circuit for sending out an electrical signal corresponding to the retrieved sequence of data;

a control circuit responsive to the operating command to control the signal output circuit to transmit a part of the electrical signal corresponding to the telephone directory number data, responsive to the detection signal to stop sending of the remaining part of the electrical signal, and responsive to a release command inputted manually through the keyboard interface circuit upon confirmation of connection to thereby restart sending of the remaining part of the electrical signal corresponding to the retrieved additional information number data;

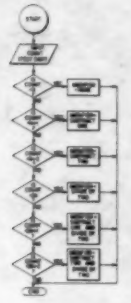
and a status output circuit connected to the control circuit for indicating when the sending of the electrical signal is temporarily stopped.

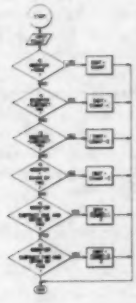
4,944,001

ROTARY DIAL PULSE RECEIVER

Brent L. Kizuik, and Richard D. Gurevich, both of Winnipeg, Canada, assignors to Comcheq Services Limited, Winnipeg, Canada

Filed Jun. 6, 1988, Ser. No. 202,633
Claims priority, application Canada, Jun. 19, 1987, 540151
Int. Cl.[5] H04M *1/64*
U.S. Cl. 379—386 **23 Claims**





21. A rotary dial pulse receiver comprising:

detection means for detecting each burst of line current activity exceeding a threshold voltage, said bursts being of the kind produced by rotary dial action in dialing a sequence of digits from a handset, said sequence including a predetermined test digit at a predetermined location in the sequence of digits dialed;

counting means connected to the detection means for providing an output count of the number of detected bursts of line current activity associated with each digit dialed; and

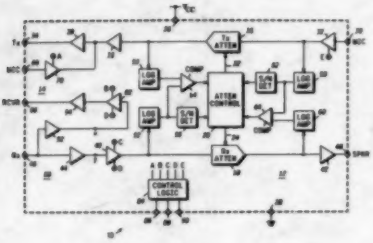
conversion means connected to the counting means and arranged to compare said output count associated with the predetermined test digit to the numerical value of said predetermined digit dialed and arranged to use such comparison to select from among a plurality of mathematical formulae one which, when applied to said output count, converts this output count to the numerical value of said test digit, and responsive to the detection of other of said bursts exceeding said threshold voltage and which correspond to other digits in said sequence of digits dialed from the handset for applying said one mathematical formula to convert the output count associated with each other digit to its respective numerical value.

4,944,002

CURRENT SWITCH FOR USE IN TELEPHONY SYSTEMS OR THE LIKE

Scott K. Bader, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 8, 1989, Ser. No. 348,459
Int. Cl.[5] H04M 9/08
U.S. Cl. 379—388 9 Claims



1. A current switch for supplying an alternating current (ac) signal received at an input to either a first or second output thereof responsive to the level state of a plurality of switching control signals applied to the current switch, the current switch comprising:

a first switchable current mirror having an input, and output and a common terminal, said input being coupled to the input of the current switch and said output being coupled to the first output of the current switch;

a second switchable current mirror having an input, an output an a common terminal, said input being coupled to the input of the current switch and said output being coupled to the second output of the current switch;

first and second switching means coupled respectively to said common terminals of said first and second switchable current mirrors and receiving first and second ones of the plurality of switching control signals;

said first switchable current mirror being rendered operative in response to said first switching control signal supplied thereto being in a first level state and being rendered non-operative when said first switching control is in a second level state;

said second switchable current mirror being rendered operative in response to said second switching control signal supplied thereto being in a first level state and being rendered non-operative when said second switching control is in a second level state;

first clamp means coupled to said input of said second switchable current mirror and being responsive both to said first switching control signal being in said first level state and a third switching control signal for maintaining the direct current voltage level at said input of said second switchable current mirror while the latter is non-operative substantially the same as when the latter is operative; and

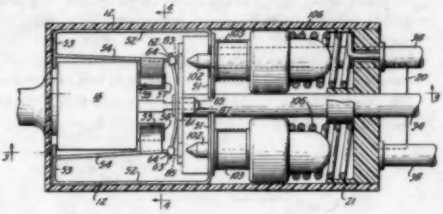
second clamp means coupled to said input of said first switchable current mirror and being responsive both to said second switching control signal being in said first level state and said third switching control signal for maintaining the direct current voltage level at said input of said first switchable current mirror while the latter is non-operative substantially the same as when the latter is operative.

4,944,003

SOLID STATE TELEPHONE PROTECTOR MODULE

Carl Meyerhoefer, Dix Hills; Helmuth Neuwirth, Garden City, and Peter Visconti, Baldwin, all of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Sep. 28, 1989, Ser. No. 413,689
Int. Cl.[5] H02H 3/22
U.S. Cl. 379—412 3 Claims



1. An improved subscriber circuit protector module comprising: an outer housing including mating base and shell elements and having an inner surface defining a cavity; a solid state integrated circuit protector chip element having a synthetic resinous casing, and having tip, ring, and ground contacts extending outwardly therefrom; a pair of elongated test point contact elements each having a clip at one end thereof engaging one of said tip and ring contacts on said chip element, and an intermediary segment having a surface forming a test point contact accessible through an opening in said housing, and a second contact extending transversely of said cavity; a fail-safe contact including an end wall, first and second resilient members extending therefrom and having free ends each having a fusable insulated sleeve thereon, each end resiliently contacting a conductor leading to one of a tip and ring contact on said chip element, said end wall having a longitudinally extending resilient grounding tab, and an opening for engagement with a ground pin on said housing; a pair of U-shaped long contact elements each having a first orificed end interconnected by an elongated segment; a ground contact element including a ground plane member having resilient tabs extending longitudinally therefrom, an elongated segment extending longitudinally therefrom in an opposite direction from that of said tab, and a transversely oriented end wall, said ground contact element partially surrounding said chip element; said first and second mentioned tabs resiliently contacting said ground contact on said chip element; a plurality of heat coil assemblies, each having a resiliently urged ground pin member for engaging said ground plane member, each of said second orificed terminals of said test point contact elements surrounding a respective ground pin member, said first orificed end of each of said long contacts also surrounding a respective ground pin member, each of said second orificed ends thereof communicating with one of a plurality of tip out pins extending outwardly of said housing; said chip element providing momentary current surge protection to a protected circuit, said heat coil assemblies providing continuous excess current protection, and said fail-safe contact providing tertiary protection in the event of heat coil assembly failure.

4,944,004

INTERFACE CIRCUIT WITH TRANSIENT EVENT TOLERANCE

Robert S. Morley, Ottawa, and Edward C. Carew, Carleton Place, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 16, 1989, Ser. No. 324,116
Int. Cl.[5] H02H 9/06; H04M 19/00
U.S. Cl. 379—412 5 Claims

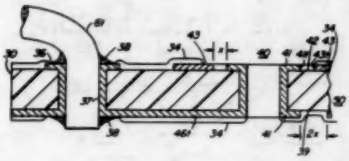
1. An interface circuit, for coupling communications signals between a conductor of a transmission path and a terminating facility, and for coupling some electrical energies, as may be

associated with transient electrical event occurrences along the transmission path, from said transmission path conductor to an earth ground, comprising:

a plurality of electrical components;

a plurality of electrical conductors each being bounded by a peripheral edge, the peripheral edges being spaced apart from each other by at least a predetermined amount, some of said conductors connecting the electrical components of the interface circuit in a workable arrangement, whereby said communications signals may be coupled;

a sheet of electrically insulating material having first and second surfaces and an opening being defined by a wall



traversing the insulating material between the first and second surfaces, the electrical components and the plurality of electrical conductors being fixed to at least one of the surfaces;

a first electrical conductor being for connection with the earth ground, said first conductor being carried by the first surface, surrounding the opening and being spaced apart therefrom; and

a second electrical conductor being for connection to the conductor of the transmission path, said second conductor being carried by said wall and protruding from the opening and being separated from said first electrical conductor by a distance of less than the predetermined amount.

4,944,005

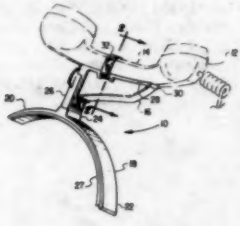
ADJUSTABLE STRAP FOR TELEPHONE HANDSET SUPPORT

Lyle H. Van Dyke, P.O. Box 14841, Portland, Oreg. 97214

Continuation of Ser. No. 154,443, Feb. 5, 1988, abandoned, which is a continuation of Ser. No. 765,695, Aug. 15, 1985, abandoned. This application Aug. 17, 1989, Ser. No. 395,181

Int. Cl.[5] H04M *1/04*; B65D *63/00*

U.S. Cl. 379—449 **1 Claim**



1. Apparatus for securing a telephone handset support to a telephone handset, said apparatus comprising:

a handset attachment member;

an arced shoulder rest having an inner concave side and an outer convex side, with a soft cushioning material affixed to said inner concave side;

an intermediary attachment member for joining said attachment member to said arced shoulder rest;

means for securing said attachment member to said telephone handset;

said intermediary attachment member for joining said attachment member to said arced shoulder rest comprising a square node mounted on the convex side of said arced shoulder rest, and said intermediary attachment member being attached to said node, said intermediary attachment member also being perpendicularly attached to said attachment member;

said attachment member comprising a concave, arcuate upper surface coextensively covered by a pad of cushioning material and having a substantially rectangular cross-section, said crossection defining a hollow region therein, said cross-section further defining an integral recessed post;

said securing means also comprising a first flexible strap member adapted to pass around and conform to a portion of said telephone handset, said first flexible strap being formed of flexible metal ribbon, and having a series of female interlocking means equidistantly dispersed along the length thereof, said female interlocking means being oriented with their longer dimensions lengthwise of said first flexible strap member, with one end of said first flexible strap member projecting perpendicularly away from said flexible strap, said end having an eyelet therein for receiving a screw;

said securing means further comprising a second flexible strap member made of flexible metal ribbon having an integral tab end with a narrowed neck for engaging said female interlocking means located on said first flexible strap member with one end projecting at an obtuse angle away from said second flexible strap member, said end having a hole therein that is passed over said post on said attachment member for attaching said second flexible strap member to said attachment member; and

a screw associated with said securing means for tightening said first and second flexible straps around said telephone handset;

said first and second flexible strap members being adapted, when secured together, to surround said telephone handset portion to secure said telephone handset to said attachment member; and

said equidistantly dispersed series of female interlocking means in said first flexible strap member permitting adjustment to accommodate a variety of telephone handset sizes and shapes.

4,944,006

SECURE DATA PACKET TRANSMISSION SYSTEM AND METHOD

Richard W. Citta, Oak Park; Paul M. Gosc, Buffalo Grove; Dennis M. Mutzabaugh, and Gary J. Sgrignoli, both of Mt. Prospect, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Division of Ser. No. 221,166, Jul. 19, 1988, Pat. No. 4,876,718, which is a division of Ser. No. 25,236, Mar. 12, 1987, Pat. No. 4,771,458. This application Apr. 25, 1989, Ser. No. 343,183

The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.

Int. Cl.[5] H04N *7/167*; H04L *9/02*

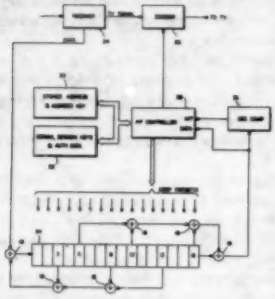
U.S. Cl. 380—20 **9 Claims**

1. In a data packet communication system having messages comprising a first data packet encrypted with a global encryption key and a second addressed data packet containing the binary address of a subscriber terminal and encrypted with an address encryption key;

a plurality of subscriber terminals each including memory means for storing a plurality of global decryption keys, an address decryption key and a binary address, the address decryption key and binary address uniquely identifying the individual subscriber terminal;

means at each subscriber terminal for attempting to decrypt said second addressed data packet with said stored address decryption key; and

means responsive to decryption of said second addressed data packet for comparing the binary address in said second addressed data packet with said binary address stored at said subscriber terminal.



4,944,007

PUBLIC KEY DIVERSIFICATION METHOD

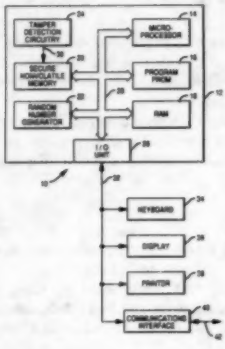
Jeffrey R. Austin, Hindhead, England, assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 12, 1989, Ser. No. 364,949

Claims priority, application United Kingdom, Aug. 19, 1988, 8819767

Int. Cl.[5] H04L *9/08, 9/30*

U.S. Cl. 380—21 **8 Claims**



1. A method of generating key values for use in public key cryptography by a requesting entity, including the step of generating at a parent entity, public key values N, e, where N is the product of first and second prime numbers P,Q and e is a corresponding public key integer value, comprising:

selecting, at said parent entity, third and fourth prime numbers R,S;

transmitting to said requesting entity a first value N_{ml} and a second value $\Phi(N_{ml})$ where said first value $N_{ml}=N\cdot R\cdot S$ and where said second value $\Phi(N_{ml})=\Phi(N)\cdot(R-1)\cdot(S-1)$, wherein the symbol Φ represents Euler's totient function;

selecting, at said requesting entity, fifth and sixth prime numbers, T,U; and

computing, at said requesting entity, a third value N_m and a fourth value d_m, where $N_m=N_{ml}\cdot T\cdot U$, and where $d_m=[1+K\ \Phi(N_m)]/e$;

wherein $\Phi(N_m)=\Phi(N_{ml})\cdot(T-1)\cdot(U-1)$; and

wherein K and d_m are integers, whereby d_m is adapted to be used by said requesting entity as a secret key counterpart of the public key value e with respect to N_m.

4,944,008

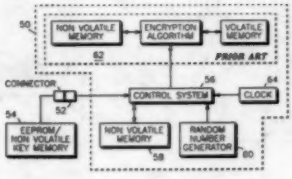
ELECTRONIC KEYING SCHEME FOR LOCKING DATA

Gerald V. Piosenka, Scottsdale; William R. Worger, Mesa, and Michael A. Savage, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 18, 1988, Ser. No. 157,002

Int. Cl.[5] H03K *1/02*

U.S. Cl. 380—46 **15 Claims**



1. In a digital processing system for providing security of data stored in the system, apparatus for protecting data in a memory of the system comprising:

key means for storing a psuedorandom combination number, said key means corresponding to a key holder;

first memory means for storing encrypted data;

second memory means for storing decrypted data, corresponding to said encrypted data;

decryption/encryption means connected between said first memory means and said second memory means, said decryption/encryption means operating to encrypt data for storage in said first memory means and further operating to decrypt data for storage in said second memory means;

control means connected to said key means and to said decryption/encryption means, said control means operating in response to said pseudorandom combination number of said key means to produce a key variable to allow said decryption of data of said first memory means for access by said key holder to said second memory means; and

said control means further operating to write a second psuedorandom combination number in said key means for subsequent accesses by said key holder.

4,944,009

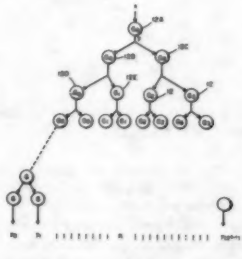
PSEUDO-RANDOM SEQUENCE GENERATOR

Silvio Micali, Cambridge, Mass., and Claus Schnorr, Bad Nauheim, Fed. Rep. of Germany, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 25, 1988, Ser. No. 160,354

Int. Cl.[5] H04L *9/02*

U.S. Cl. 380—46 **60 Claims**



1. A random sequence generator for generating a random

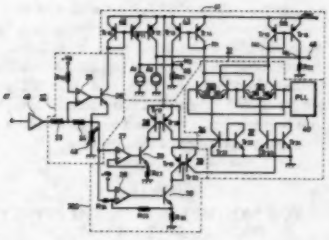
sequence from a seed random sequence of substantially shorter length, the generator performing a tree operation by extending, at each node of a tree structure, a node input random sequence into a longer node output random sequence, a plurality of node output random sequences of the tree structure together comprising a final random output sequence.

4,944,010

STEREO DEMODULATOR AND A DEMODULATING METHOD THEREOF

Kazuhisa Ishiguro, and Mikio Yamagishi, both of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 10, 1988, Ser. No. 269,903
Claims priority, application Japan, Nov. 19, 1987, 62-292440
Int. Cl.[5] H04H 5/00
U.S. Cl. 381—4 **10 Claims**



1. A stereo demodulator for demodulating right and left stereophonic signals from an FM-detected stereophonic composite signal, said stereophonic composite signal including, in a frequency divisionally multiplexed form, a main channel of a sum signal obtained by addition of said right and left stereophonic signals and a subchannel of a carrier-suppressed modulated difference signal obtained by subtraction of said right and left stereophonic signals, said stereo demodulator comprising:

sum signal generating means (22) for generating the sum signal of said main channel after having performed negative feedback amplification of said FM detected stereophonic composite signal and outputting the generated sum signal in the form of a current signal,

subchannel detecting means (300) for detecting said subchannel signal after said negative feedback amplification means has performed negative feedback amplification of said FM-detected stereophonic composite signal and for thereafter outputting the detected subchannel signal in the form of a current signal,

difference signal demodulating means (31) for demodulating said difference signal of said detected subchannel signal received from said subchannel detecting means and for thereafter outputting the demodulated difference signal in the form of a current signal, and

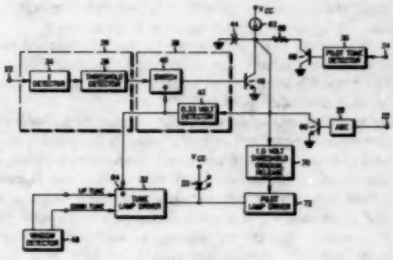
matrix means (41) for receiving said sum signal from said sum signal generating means and said demodulated, difference signal from said difference signal demodulating means to perform matrix processing of the received sum signal and difference signal and for thereby reproducing said right and left stereophonic signals to output the reproduced right and left stereophonic signals in the form of voltage signals.

4,944,011

CIRCUIT FOR CONTROLLING OPERATOR INDICATORS IN AN AM STEREO RECEIVER

Lawrence M. Eckland, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 21, 1987, Ser. No. 87,839
Int. Cl.[5] H04H 5/00
U.S. Cl. 381—15 **16 Claims**



1. In an AM stereo radio receiving an AM input signal, a circuit for controlling a stereo indicator, comprising:

detection means for detecting that the input signal is a stereo signal; and

driving means, responsive to the detection means, for gradually activating the visual stereo indicator,

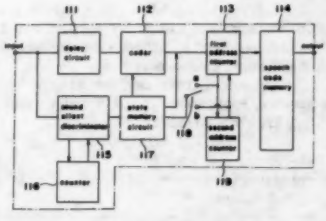
wherein the driving means includes a low gain amplifier which generates a gradually increasing signal in response to the detection means so as to prevent sudden power drains from affecting the circuit.

4,944,012

SPEECH ANALYZING AND SYNTHESIZING APPARATUS UTILIZING DIFFERENTIAL VALUE-BASED VARIABLE CODE LENGTH CODING AND COMPRESSION OF SOUNDLESS PORTIONS

Tomokazu Morio; Yoshiji Fujimoto, both of Nara, and Atsunori Kitoh, Yamatotakada, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 15, 1988, Ser. No. 144,478
Claims priority, application Japan, Jan. 16, 1987, 62-8783; Jan. 17, 1987, 62-8806
Int. Cl.[5] G10L 7/02; H04B 14/06
U.S. Cl. 381—30 **11 Claims**



2. An apparatus for storing coded sounded portions of an input speed signal while compressing soundless portions of said input speech signal in substantially real time, the apparatus comprising:

input means for inputting said speech signal;

delay means, operatively connected to said input means, for delaying said input speech signal for a predetermined time period (τ);

sound discriminating means, operatively connected to said input means, for receiving said input speech signal simultaneously to said delay means, and for judging said input speech signal at a real-time (τ) to be in a soundless state or a sounded state;

encoder means, operatively connected to said delay means, for sequentially coding said input speech signal at a delayed time ($t-\tau$);

first address means, operatively connected to said encoder means, for sequentially counting at $t-\tau$ to designate an address location of a speech code memory means at which said coded input speech signal is stored;

speech code memory means, operatively connected to said first address means, for sequentially storing said coded input speech signal at an address sequentially designated by said first address means;

state memory means, operatively connected to said sound discriminating means and said encoder means, for starting said encoder means to code said input speech signal, upon receiving a judgment from said sound discriminating means indicating input speech signal is in a sounded state, and store said input speech signal in a sounded stated at sequentially designated address locations of said speech code memory means, designated by said first address means, wherein said judgment occurs at time t and said encoding occurs at delayed time $t-\tau$ thereby allowing for a smooth transition in coding the beginning and ending of said sounded state of said input speech signal;

said sound discriminating means, upon judging said input speech signal to be in a soundless state, for a first predetermined period of time (ta), sending said judgment to said state memory means;

said first address means, upon receiving the judgment of a soundless state of said input speech signal from said state memory means, storing its address count as a startup count in a second address means;

said second address means, operatively connected to said state memory means and said first address means, for sequentially counting address locations starting from said startup count;

said state memory means, upon receiving a signal from said sound discriminating means, indicating a judgment that said input speech signal has remained in a soundless state for a second predetermined period (tb), stopping said encoder means and initiating a transfer of the address count in the second address means to the first address means, wherein said input speech signal in a soundless state is compressed in substantially real-time and only said input speech signal in a sounded state has thus been coded and stored in said speech code memory means.

4,944,013

MULTI-PULSE SPEECH CODER

Nikolaos Gouvianakis, and Costas Xydeas, both of Loughborough, England, assignors to British Telecommunications public limited company, United Kingdom

Filed Apr. 1, 1986, Ser. No. 846,854

Claims priority, application United Kingdom, Apr. 3, 1985, 8508669; Jun. 19, 1985, 8515501

Int. Cl.[5] **G10L** *7/02*

U.S. Cl. 381—38 **18 Claims**

13. An apparatus for speech coding comprising: means for receiving speech samples;

means for processing the speech samples to derive parameters representing a response of a synthesis filter;

means for deriving, from the parameters and the speech samples, pulse position and amplitude information defining an excitation consisting, within each of successive time frames corresponding to a plurality n of said speech samples, of a pulse sequence containing a smaller plurality k of pulses;

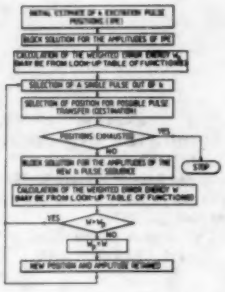
wherein the means for deriving pulse position and amplitude information of the k pulses includes:

(1) further means for deriving an initial estimate of the positions and amplitudes of the k pulses, and

(2) means for carrying out an iterative adjustment process by:

(a) selecting individual ones of the k pulses according to predetermined criteria, and

(b) substituting for each such selected pulse a pulse in an



alternative position whenever a computed error signal is thereby reduced, said error signal being obtained by means for comparing speech samples with the response of a filter having said parameters to an excitation which includes said selected pulse and others of said pulses, said substituted alternative position thereby being obtained as a function of the position and amplitudes of said other pulses.

4,944,014

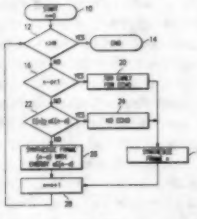
METHOD FOR SYNTHESIZING ECHO EFFECT FROM DIGITAL SPEECH DATA

Michel G. Stella, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 21, 1988, Ser. No. 287,830

Int. Cl.[5] **G10L** *5/02;* **H03G** *3/00*

U.S. Cl. 381—51 **11 Claims**



1. A method for synthesizing an echo effect from an encoded digital speech signal, said method comprising:

providing a plurality of consecutive speech data frames of digital speech data as coded speech parameters including an energy parameter for each frame in a sequential speech data frame sequence of frames of similar duration and representative of spoken speech;

providing a predetermined delay period as an integer multiple of a number of speech data frame durations;

sequentially comparing the integer multiple of the predetermined delay period with each number corresponding to consecutively numbered frames in the speech data frame sequence;

providing the energy parameter of the current speech data frame and the energy parameter of an earlier speech data frame when the number of the current speech data frame

is greater by an integer value than the integer multiple of the predetermined delay period;

multiplying the energy parameter of the earlier speech data frame by a constant attenuation factor to provide an attenuated energy parameter;

comparing the energy parameter of the current speech data frame with the attenuated energy parameter of the earlier speech data frame;

replacing the current speech data frame in a speech data frame output sequence corresponding to the original order of the speech data frames in the speech data frame sequence with a new replacement speech data frame having the speech parameters of the earlier speech data frame and the attenuated energy parameter provided that the attenuated energy parameter is greater than the energy parameter of the current speech data frame;

transmitting the speech data frame output sequence including the replacement speech data frame to a speech synthesizer;

generating an analog audio speech signal from the speech synthesizer in response to the speech data frame output sequence transmitted thereto; and

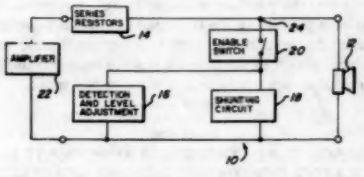
producing audible synthesized speech having an echo effect provided therein from the analog audio speech signal generated by said speech synthesizer.

4,944,015

AUDIO COMPRESSION CIRCUIT FOR TELEVISION AUDIO SIGNALS

Ronald A. Juve, 4527 Patton Ave., Boise, Id. 83704, and George S. Kaufman, 456 Tenth St., Del Mar, Calif. 92014

Filed Apr. 29, 1988, Ser. No. 187,733
Int. Cl.[5] H03G *11/00*
U.S. Cl. 381—55 **29 Claims**



1. An audio compression circuit for processing an audio signal comprising in combination:

amplifier means for supplying the audio signal at a source voltage;

resistance means connected in series to said amplifier means for providing a minimum resistance to said amplifier means and creating a voltage drop of said source voltage to establish a supply voltage;

detection means connected to said resistance means for increasing the supply voltage to a reference voltage;

level adjustment means connected to said detection means for processing the reference voltage into a continuously variable control voltage;

shunting means connected to said level adjustment means and said resistance means, said shunting means operative by said control voltage for changing the resistance of said shunting means in a continuous manner in response to said control voltage to establish a maximum output voltage; and

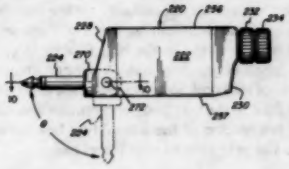
loudspeaker means connected in parallel to said amplifier means for receiving an output voltage from the circuit and producing an audio sound.

4,944,016

PORTABLE MUSICAL INSTRUMENT AMPLIFIER

David E. Christian, Danbury, Conn., assignor to CB Labs, Inc., Norwalk, Conn.

Continuation of Ser. No. 121,166, Nov. 16, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,415
Int. Cl.[5] H04R *1/10*
U.S. Cl. 381—74 **15 Claims**



1. A portable musical instrument amplifier comprising:

an electronic amplifying and signal processing system;

a body containing said electronic amplifying and signal processing system;

an input plug projecting from and directly, pivotally attached to said body without an interconnection cable so that said input plug pivots with respect to said body, said input plug being electrically coupled to said electronic amplifying and signal processing system; and

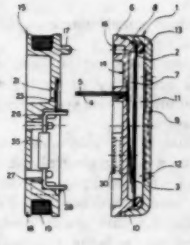
headphone connection means in said rigid body adapted to connect physically and electrically said electronic amplifying and signal processing system to headphones, whereby, when said input plug is inserted into a musical instrument output jack, said electronic amplifying and signal processing system produces an amplified signal from the instrument capable of being heard with headphones.

4,944,017

ELECTROACOUSTIC INSERT WITH ADDED COIL

Christian Cognasse; Peter Graham; Bernard Maury, and Jean-Claude Walter, all of Bonneville, France, assignors to Horlogerie Photographique Francaise, Bonneville, France

Filed Mar. 23, 1989, Ser. No. 327,736
Claims priority, application France, Apr. 1, 1988, 88 04733
Int. Cl.[5] H04B *5/00*
U.S. Cl. 381—79 **10 Claims**



1. An electroacoustic transducer, comprising a telephone receiver insert formed of a membrane transforming into sound vibrations the electric signals conveyed to axial input connectors by a supply line, said membrane being inserted in a case formed of a base body and a cover, the transducer further comprising an auxiliary device formed of an electric coil, fed by the electric signals of the supply line, and producing an auxiliary magnetic field modulated by these signals and able to be picked up by a hearing aid for the hard of hearing, the coil

being contained in a coil body forming a separate assembly from the insert and which can be fitted and fixed to the case of the insert, the coil body comprising two axial passages into which the axial input connectors penetrate, wherein:

said insert case comprises a rear face with means for fitting the coil body,

the coil body comprises means for fixing to the rear face of the insert case,

resilient conductors disposed in the axial passages of the coil body and connected electrically to the coil winding remain in resilient abutment on the insert connectors when the coil body is fitted to the rear face of the insert case,

said axial input connectors have a length greater than the thickness of said coil body, so that their ends project from the rear face of the coil body and remain accessible for the electric connection of the assembly when the coil body is fitted to the rear face of said insert case.

4,944,018

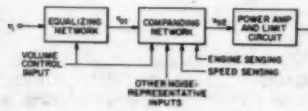
SPEED CONTROLLED AMPLIFYING

Amar G. Bose, Wayland, and Joseph L. Veranth, Southborough, both of Mass., assignors to Bose Corporation, Framingham, Mass.

Continuation of Ser. No. 177,443, Apr. 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 465,818, Feb. 14, 1983, abandoned. This application Jul. 18, 1989, Ser. No. 383,295

Int. Cl.[5] H03G *3/20*

U.S. Cl. 381—86 **12 Claims**



1. In a vehicle having an engine for powering the vehicle and a sound amplifying system characterized by a frequency response including a signal source and having a manually operable sound level setting control means for establishing the sound level of a desired signal in said vehicle, a power amplifier and electroacoustical transducing means, the improvement comprising,

a source of an engine signal representative of the on and off condition of said engine,

variable gain means associated with said sound level setting control means responsive to an input electrical audio signal to be amplified by said system for providing a signal of controlled amplitude,

wherein said manually operable sound level setting control means comprises a manual control and, dynamic equalization circuit means for providing a predetermined equalization over the bases frequency range depending on the sound level setting of said manual control.

said variable gain means being responsive to said engine signal for controlling the gain of said system to increase and decrease in response to said engine being on and off respectively,

said manually operable sound level setting control means including means for changing the frequency response of said system when altering the gain of said system much more significantly than when said variable gain means alters said gain such that said frequency response with the engine being on is always different from said frequency with the engine being off.

4,944,019

LOW SOUND REGION REPRODUCING SPEAKER SYSTEM

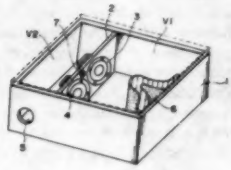
Hiroshi Watanabe, Hachioji, Japan, assignor to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed Mar. 1, 1989, Ser. No. 317,404

Claims priority, application Japan, Mar. 1, 1988, 63-26009[U]

Int. Cl.[5] H04R *1/02*

U.S. Cl. 381—90 **5 Claims**



1. A low sound region reproducing speaker system comprising a box closed on all its sides and having at least one sidewall, a partition wall separating the internal space of the box into two spatial portions, a pair of speakers attached to the partition wall where one of the speakers is responsive to a right stereophonic channel signal and the other speaker is responsive to a left stereo-phonic channel signal, one of said spatial portions having no aperture open to space external to the box and an aperture being formed in said one side wall of the box through which the other of the spatial portions communicates with the space external to the box whereby right and left stereo-phonic channel signals are reproduced individually as sounds through the pair of speakers, the sounds are mixed acoustically within the box, a sound region other than a low sound region of the mixed sounds and of a predetermined band width is attenuated by two resonant systems defined by the two spatial portions and the aperture and different in resonant frequency and only the low sound region is emitted into the external space, characterized in that the partition wall has therein a communication hole for communicating the two spatial portions therethrough with each other so that a bass reflex operation is performed by the acoustic action of the communication hole and the spatial portion with no aperture open to the external space.

4,944,020

TEMPERATURE COMPENSATION CIRCUIT FOR NEGATIVE IMPEDANCE DRIVING APPARATUS

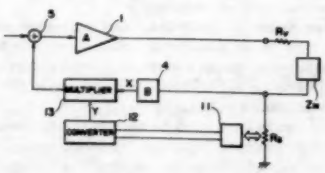
Masao Noro, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed May 26, 1989, Ser. No. 357,701

Claims priority, application Japan, May 31, 1988, 63-133389; Jun. 29, 1988, 63-161992

Int. Cl.[5] H04R *3/00*

U.S. Cl. 381—96 **2 Claims**



1. An amplifier for driving a speaker as a load, comprising:

current detection means inserted in series with said speaker;

feed back means for positively feeding back a detection output of said current detection means for generating a negative resistance component in an output impedance,

thereby equivalently eliminating or invalidating a DC resistance component of voice coil of said speaker;

said current detection means being formed of a member which has a heat radiation resistance and a thermal time constant for setting an increase in temperature of the member to be almost equivalent to that of voice coil material of said speaker; and

temperature sensitive means which has a predetermined temperature coefficient and is thermally coupled to the current detection means;

a feedback amount of said detection output being controlled by an electrical change amount corresponding to temperature of said temperature sensitive means.

4,944,021

IDENTIFICATION SYSTEM EMPLOYING VERIFICATION OF FINGERPRINTS

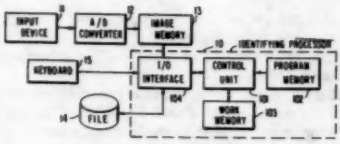
Yukio Hoshino, and Ko Asai, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 134,554, Dec. 16, 1987, abandoned, which is a continuation of Ser. No. 724,232, Apr. 17, 1985, abandoned. This application Oct. 6, 1989, Ser. No. 418,990

Claims priority, application Japan, Apr. 18, 1984, 59-78155; Apr. 18, 1984, 59-78156; Apr. 18, 1984, 59-78157; Apr. 18, 1984, 59-78158; Apr. 18, 1984, 59-78159

Int. Cl.[5] G06K 9/00

U.S. Cl. 382—5 **13 Claims**



1. An identification system comprising:

input means for collecting a streaked pattern of a fingerprint from a surface of a finger to store a streaked pattern image;

storing means for storing a plurality of pattern features of a plurality of registered fingerprints, each of said pattern features including at least information identifying within a coordinate system the positions of first and second registered feature points and a registered number of streaks of said registered fingerprints existing between said first and second registered feature points;

selecting means for selecting one of said pattern features as a reference pattern feature from said storing means; and

identifying means for verifying correspondence between said streaked pattern image and said reference pattern feature, said identifying means determining at least on the basis of coordinate values first and second objective areas in said streaked pattern image at positions corresponding to said positions of said first and second registered feature points of said reference pattern feature, respectively, scanning said first and second objective areas in order to detect first and second candidate feature points, respectively, counting a number of streaks of said streaked pattern image existing between said first and second candidate feature points to generate a count value, and comparing said count value with said registered number.

4,944,022

METHOD OF CREATING DICTIONARY FOR CHARACTER RECOGNITION

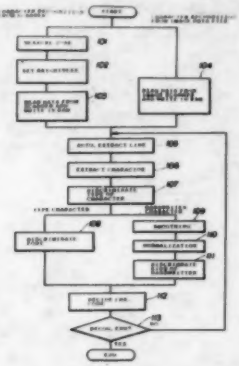
Kenji Yamjima, Yokohama, and Masao Hashimoto, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 17, 1987, Ser. No. 134,165

Claims priority, application Japan, Dec. 19, 1986, 61-302900

Int. Cl.[5] G06K 9/62

U.S. Cl. 382—14 **19 Claims**



1. A method of creating a dictionary for character recognition, comprising the steps of:

optically scanning a sheet having a character line having a plurality of identical characters aligned in a scanning direction, a mark defining a size of said character line being provided in the vicinity of said character line;

generating image data of each of said identical characters within said character line having the size defined by said mark, said image data of each of said identical characters forming an individual dot pattern;

carrying out a predetermined image processing for said individual dot patterns of said identical characters to thereby generate a single dot pattern serving as a reference dot pattern of said identical characters;

inputting a character code corresponding to said single dot pattern; and

registering said single dot pattern and said character code in a storage region of a dictionary file for character recognition.

4,944,023

METHOD OF DESCRIBING IMAGE INFORMATION

Ksoru Imao, Yokohama, and Hideyuki Watanabe, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed May 18, 1988, Ser. No. 195,266

Claims priority, application Japan, May 19, 1987, 62-120027; May 19, 1987, 62-120028; May 20, 1987, 62-121080; May 25, 1987, 62-125976

Int. Cl.[5] G06K 9/00

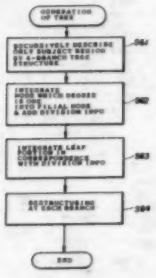
U.S. Cl. 382—37 **16 Claims**

1. A method of describing an image made up of a plurality of kinds of regions in an n-dimensional space by a tree structure, said method comprising:

a first step of recursively and equally dividing said image in the n-dimensional space into 2^n regions until each of the 2^n regions include two or less kinds of regions, thereby making a first level of said tree structure having a root node corresponding to said image in its entirety, L nodes connected to said root node and each corresponding to a region with three or more kinds of regions and M leaves connected to said root node or a node and each corresponding to a region with two or less kinds of regions,

where L=0, 1, 2, . . . , n, M1, 2, 3, . . . , n and L+M=n, each of said nodes having branches branching out therefrom and connecting to a filial node or leaf thereof; and

a second step of recursively and equally subdividing each of said 2^n regions in the n-dimensional space into 2^n subregions until each subregion includes only one kind of region and for describing only one of two kinds of regions by a tree structure in which each node which degree is one and only having one branch is integrated into a filial node or leaf thereof, thereby making a second level of said tree structure, each node in the second level of said tree



structure being added with first division information described by sequential data of 2^n kinds of codes corresponding to position information of each node with respect to a parent node thereof, each leaf in the second level of said tree structure being added with second division information, said second division information describing at least a least significant code of said first division information by 2^n or more kinds of codes which are pattern information of each leaf with respect to a parent node thereof,

said tree structure describing said image in the first and second levels thereof.

4,944,024

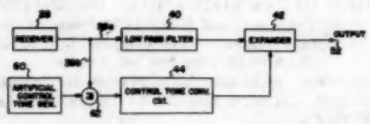
METHOD AND APPARATUS FOR REDUCING NOISE IN A LINKED COMPRESSOR-EXPANDER TELECOMMUNICATIONS SYSTEM

James H. Leveque, Ellicott City, Md., assignor to AMAF Industries, Inc., Columbia, Md.

Filed Feb. 2, 1989, Ser. No. 305,402

Int. Cl.[5] H04B *1/16*

U.S. Cl. 455—35 **16 Claims**



1. In a linked compressor expander (Lincompex) communications system transmitting a communication signal comprising a compressed complex waveform and a control tone signal having a frequency representative of the amount of attenuation of said compressed complex waveform over a transmission medium to a receiving station, the method of reducing random noise level generation at a demodulator in the absence of communication signal transmission, comprising the steps of:

determining a threshold level below which Lincompex demodulation is found not to occur;

developing an artificial control tone signal having a level substantially at said threshold level and having a frequency effective to bias random noise level generation at said to a demodulator substantially constant minimum level; and

injecting said artificial control tone signal into said demodulator to produce said substantially constant minimum level at an output thereof in the absence of communication signal transmission.

4,944,025

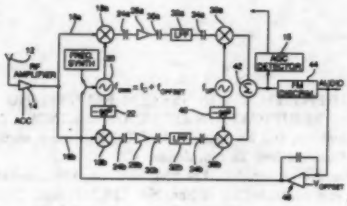
DIRECT CONVERSION FM RECEIVER WITH OFFSET

Mark R. Gehring, Portland; Richard R. Suter, Beaverton, both of Oreg., and Lawrence H. Ragan, Richardson, Tex., assignors to AT&E Corporation, San Francisco, Calif.

Filed Aug. 9, 1988, Ser. No. 229,976

Int. Cl.[5] H04B *1/16*; H03D *3/18*

U.S. Cl. 455—207 **10 Claims**



1. A direct conversion receiver for processing frequency modulated radio signals that are centered about a carrier frequency, the frequency modulation extending a first sideband bandwidth above and below the carrier frequency, the receiver comprising:

means for receiving the radio signals, said receiving means having an output;

a pair of signal paths each having an input coupled to the output of the receiving means;

a local oscillator tuned to a local oscillator frequency and having an output;

each of said signal paths including a first mixer serially coupled therein, each of said first mixers having a local oscillator input coupled to the local oscillator output;

each of said signal paths further including an AC coupling means serially coupled therein, each of said AC coupling means producing a notch centered at DC in a frequency response of each of said signal paths, said notch extending a second sideband bandwidth above and below DC;

wherein the local oscillator frequency is set equal to the carrier frequency plus an offset frequency, said offset frequency being greater than or equal to the sum of the first and second sideband bandwidths.

4,944,026

RADIATION IMAGE STORAGE PANEL

Satoshi Arakawa, Minami-ashigara; Kenji Takahashi, Odawara, and Yuichi Hosoi, Chigasaki, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 5,666, Jan. 21, 1987, abandoned. This application Jul. 26, 1988, Ser. No. 225,668

Claims priority, application Japan, Jan. 21, 1986, 61-11296; Jan. 22, 1986, 61-11558; Jan. 22, 1986, 61-11559; Jan. 22, 1986, 61-11560; Jan. 22, 1986, 61-11561; Jan. 22, 1986, 61-11562; Dec. 27, 1986, 61-309759

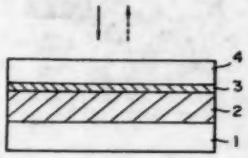
The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.

Int. Cl.[5] G03B *42/00*

U.S. Cl. 250—484.1 **15 Claims**

1. A radiation image storage panel comprising a phosphor layer which contains a stimulable phosphor, characterized in that one surface of said phosphor layer is provided with a multi-layer optical filter (1) which has a transmittance of not

less than 70% for the light of the stimulation wavelength of said stimulable phosphor and at an incident angle in the range of 0°–5° and has a reflectance of not less than 60% for the light of said stimulation wavelength and at an incident angle of not smaller than 30°, and the other surface of said phosphor layer



is provided with a multi-layer optical filter (2) which has a reflectance of not less than 60% for the light of said stimulation wavelength and a transmittance of not less than 60% for the light of the wavelength of the stimulated emission of the stimulable phosphor.

4,944,028

NON-CONTACT TYPE PATTERN SENSOR WITH VARIABLE CLEARANCE COMPENSATION

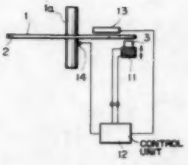
Kenzaburou Iijima; Yoshinori Hayashi, both of Hamamatsu, and Kazuo Kurahashi, Hamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Continuation of Ser. No. 946,321, Dec. 24, 1986, abandoned. This application Nov. 10, 1988, Ser. No. 271,388

Claims priority, application Japan, Dec. 28, 1985, 60-299415; Mar. 5, 1986, 61-47761; May 23, 1986, 61-119838; May 26, 1986, 61-120579

Int. Cl.[5] G01B *7/14*

U.S. Cl. 324—207.12 **2 Claims**



1. An improved non-contact type pattern sensor, comprising:

a magnetic resistor element arranged facing a pattern track on a recording medium having a magnetized pattern in said pattern track and having a resistance which varies as a function of a magnetic field of a facing portion of said pattern track;

a clearance sensor arranged near said recording medium and generating a detection signal indicative of the distance between said clearance sensor and said recording medium;

a control unit connected to said clearance sensor and generating an output signal in response to said detection signal; and

a piezo-electric element connected to said control unit and holding said magnetic resistor element, said piezo-electric element moving said magnetic resistor element towards and away from said magnetized pattern on said recording medium as a function of said output voltage.

4,944,029

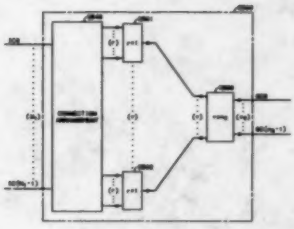
REARRANGEABLE MULTICONNECTION SWITCHING NETWORKS CONSTRUCTED USING COMBINATORIAL DESIGNS

Frank K. Hwang, Warren, N.J., and Gaylord W. Richards, Naperville, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 946,431, Dec. 23, 1986, Pat. No. 4,887,079. This application Jul. 19, 1989, Ser. No. 382,501

Int. Cl.[5] H04Q *3/62*; H04M *3/00*

U.S. Cl. 340—825.800 **6 Claims**



1. A switching network for selectively connecting N_1 input channels to n_2 output channels such that none of said n_2 output channels is connected to more than one of said N_1 input channels at any time, N_1 and n_2 being positive integers each greater than one, n_2 being at most equal to N_1, said switching network comprising

a partial concentrator having N_1 columns each connected to a different one of said N_1 input channels, and v rows, said partial concentrator comprising means for selectively connecting ones of said columns to ones of said rows, v being a positive integer at least equal to n_2, and

a switch having n_2 outlets each connected to a different one of said output channels and v inlets each connected to a different one of said rows, said switch comprising means for selectively connecting said outlets to said inlets,

said partial concentrator being derivable from a partial concentrator having ur columns and Mu rows and having each of said Mu rows incident to ones of said ur columns defined by a corresponding row of a Mu×r connection matrix, where a row is said to be incident to a column if there is a crosspoint at the intersection, where each of said ur columns has a unique column designation, where said matrix has Mu rows comprising M sets, $s_0, s_1, \ldots s_{M-1}$, each having u rows, where the column designation of each of said ur columns occurs exactly once in set s_0, where for any integer i,

$1 \leq i \leq M-1$, for any integer j,

$0 \leq j \leq r-1$, and for M−1 (u,r,w) difference sets

$D_i=(a_0^i, \ldots a_{r-1}^i)$, column j of set s_i is obtained by rotating column j of set s_0 by a_j^i positions, where w is a positive integer, where M, r and u are positive integers each greater than one, where ur is at least equal to N_1, and where Mu is at least equal to v.

4,944,030

LENS SHUTTER CAMERA INCLUDING ZOOM LENS

Keisuke Haraguchi; Shinsuke Kohmoto; Takeo Kobayashi; Shigeru Kondoh; Hideki Ohkubo; Norio Numako; Saburo Sugawara; Susuo Nakamura; Hirofumi Matsuo; Katsuhiko Nomura; Etsuro Nishio, and Haruo Ishii, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

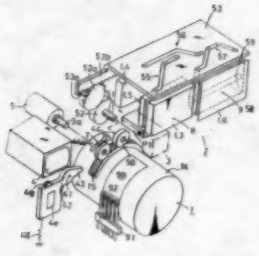
PCT No. PCT/JP87/00293, § 371 Date Jan. 7, 1988, § 102(e) Date Jan. 7, 1988, PCT Pub. No. WO87/07038, PCT Pub. Date Nov. 19, 1987

PCT Filed May 12, 1987, Ser. No. 144,030

Claims priority, application Japan, May 12, 1986, 61-108278; May 12, 1986, 61-108279; May 28, 1986, 61-80861; Jun. 2, 1986, 61-127496; Jun. 2, 1986, 61-83932; Jun. 21, 1986, 61-145470; Jun. 26, 1986, 61-150995; Aug. 15, 1986, 61-125045; Aug. 22, 1986, 61-196911; Aug. 29, 1986, 61-132661; Aug. 29, 1986, 61-132658; Aug. 29, 1986, 61-132659; Aug. 29, 1986, 61-132660; May 28, 1987, 61-80862

Int. Cl.[5] G03B *3/00, 5/00, 15/03, 13/12*

U.S. Cl. 354—403 111 Claims



1. A camera having a finder optical assembly and a photographic optical assembly with different optical axes, said photographic optical assembly including a movable zoom lens, said camera further comprising a strobe assembly, and means for driving said zoom lens, for driving said finder optical assembly in association with zooming movement of said zoom lens in order to vary the field of view through said finder optical assembly and for driving said strobe assembly in association with zooming movement of said zoom lens, said means for driving said zoom lens said finder optical assembly and said strobe assembly including at least one gear positioned about at least a portion of said zoom lens, said gear being rotatable in association with linear movement of said zoom lens along said photographic optical axis.

4,944,031

OPERATIONAL CONDITION SETTING DEVICE FOR AN OFFICE MACHINE

Hirobumi Yoshino, Tokyo; Takashige Ito, Yokohama; Junichi Kawase, Kawasaki, and Hiroyuki Maeda, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 28, 1989, Ser. No. 329,805

Claims priority, application Japan, Mar. 29, 1988, 63-75262; Mar. 29, 1988, 63-75263; Mar. 29, 1988, 63-75265

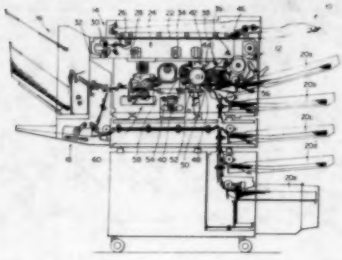
Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—206 15 Claims

1. An apparatus for setting operational conditions of an office machine which performs a recording operation by using a menu sheet having a predetermined format and provided with an area for writing information, comprising:

reading means for reading the information written in said area of said menu sheet; and

mode setting means for setting operational modes of said office machine on the basis of the information read by said reading means and for ignoring any information read by said reading means which is representative of an operation condition which is not available with said office machine and further for causing said machine to start a recording



operation automatically when the operational conditions are fully set up.

4,944,032

MULTIPLEX SIGNAL PROCESSING APPARATUS

Sadashi Kageyama, Hirakata; Yoshio Abe, Ibaraki; Yoshio Yasumoto, Nara; Shuji Inoue, Neyagewa; Hitoshi Takai, Hirakata; Mitsujiro Matsumoto, Shijyonawate; Kouji Aono, Saijyo; Kiyoshi Uchimura, Hirakata, and Iwasaki Eiji, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

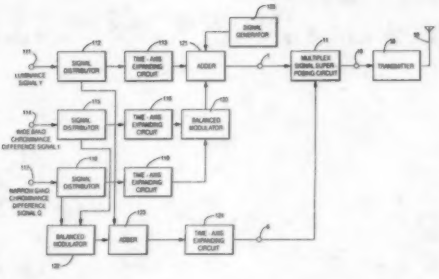
Division of Ser. No. 70,804, Jul. 7, 1987, Pat. No. 4,882,614.

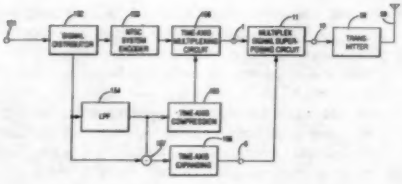
This application May 1, 1989, Ser. No. 345,712

Claims priority, application Japan, Jul. 14, 1986, 61-164915; Jul. 31, 1986, 61-180338; Jul. 31, 1986, 61-180333; Sep. 30, 1986, 61-231666; Oct. 23, 1986, 61-252225

Int. Cl.[5] H04N *11/00, 7/00, 7/093, 7/12*

U.S. Cl. 358—12 5 Claims





1. An apparatus for transmitting a wide aspect ratio television signal corresponding to an image displayed on a television screen having a wider aspect ratio than 4:3, comprising:

a first time-axis expanding means for expanding on time-axis a first part of said wide aspect ratio television signal corre-

sponding to the aspect ratio of 4:3 to obtain a first television signal;

a second time-axis expanding means for expanding on time-axis a second part which is the remaining part other than the first part of said wide aspect ratio television signal to obtain a second television signal;

a quadrature modulation means for quadrature modulating said first and second television signal to obtain a multiplexed television signal; and

a mean for transmitting said multiplexed television signal.

3. An apparatus for transmitting a wide aspect ratio television signal corresponding to an image displayed on a television screen having a wider aspect ratio than 4:3, comprising:

a first time-axis expanding means for expanding on time-axis a first part of said wide aspect ratio television signal corresponding to the aspect ratio of 4:3 to obtain a first television signal;

a signal separating means for separating the remaining part other than the first part of said wide aspect television signal into second and third parts;

a time-axis compressing means for compressing on time-axis said second part to obtain a second television signal;

a second time-axis expanding means for expanding on time-axis said third part to obtain a multiplex signal;

a time-axis multiplexing means for multiplexing on time-axis said first and second television signal to obtain a main television signal;

a quadrature modulation means for quadrature modulating said main television signal and said multiplex signal to obtain a multiplexed television signal; and

a means for transmitting said multiplexed television signal.

4,944,033

COMMUNICATIONS SYSTEM FOR AN INSTALLATION AND METHOD OF CONTROLLING SUCH INSTALLATION

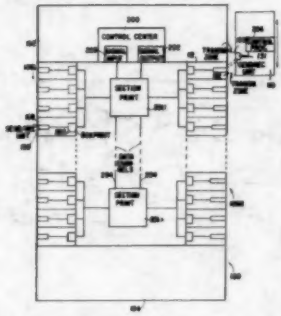
Markus Erni, Winterthur, Switzerland, assignor to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed May 19, 1988, Ser. No. 195,857

Claims priority, application Switzerland, May 20, 1987, 01933/87

Int. Cl.[5] G06K *17/00*; G06F *15/46*

U.S. Cl. 364—470 **11 Claims**



1. An installation comprising:

a number of material-processing stations each having an at least partly independently operating control means;

means for transmitting information between said at least partly independently operating control means of said number of material-processing stations;

at least one tender for making predeterminate interventions at individual ones of said material-processing stations;

said at least one tender and said number of material-processing stations being relatively movable with respect to one another; and

means for exchanging information between said at least one tender and the at least partly independently operating control means at said individual ones of said material-processing stations when said at least one tender and said individual ones of said material-processing stations are in a predetermined relationship to one another, in order to thereby make said predeterminate interventions by said at least one tender at said individual ones of said material-processing stations.

4,944,034

GEOMETRIC PROCESSING SYSTEM

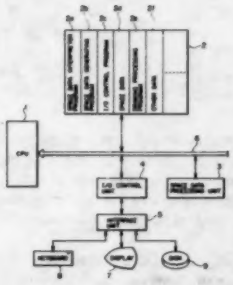
Akira Ohsawa, Higashimurayama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 27, 1986, Ser. No. 867,154

Claims priority, application Japan, May 24, 1985, 60-110346; Jun. 5, 1985, 60-120401; Jun. 28, 1985, 60-140301

Int. Cl.[5] G06F *3/14*

U.S. Cl. 364—522 **29 Claims**



12. A drawing processing system comprising:

data holding means for holding space data which identifies partial spaces inside and outside of a plurality of figures within a geometric space which is divided into said plurality of partial spaces by imaginary division lines passing through characteristic points of said figures, said space data having characteristic point information corresponding to each characteristic point, said characteristic point information being formed as a set of two characteristic points, each characteristic point being used in common to identify partial spaces which are adjacent to each other; and

means, which is coupled to said holding means and which responds to operator input, for accessing said holding means to obtain a portion of said space data and for performing draw processings on said portions of said space data.

4,944,035

MEASUREMENT OF THERMAL CONDUCTIVITY AND SPECIFIC HEAT

Aagardl Roger L., Prior Lake; Ulrich Bonne, Hopkins, and Robert J. Matthys, Minnespolis, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 24, 1988, Ser. No. 210,892

Int. Cl.[5] G06F *15/20*; G01K *17/08*

U.S. Cl. 364—556 **28 Claims**

1. Apparatus for determining thermal conductivity, k, and specific heat, c_p, of a fluid of interest comprising;

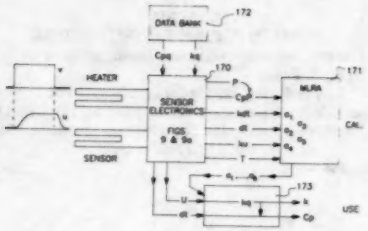
heater means;

thermal sensor means in proximate position to said heater means and in thermal communication therewith through

the fluid of interest, said sensor means being one having a temperature dependent output;

adjustable energizing means connected to said heater means for energizing said heater means on a pulsed time-variable basis in a manner to induce both transient and substantially steady-state elevated temperature condition intervals in said thermal sensor means;

first output means for providing first output signal indicative of the temperature of said thermal sensor means;



means for determining the rate of change of temperature of said temperature sensor during a transient temperature interval based on time variation of said first output signal;

means for detemining k of the fluid of interest based upon the first output signal at steady-state elevated sensor temperature; and

means for determining C_p of the fluid of interest based on k and the rate of change of the first output during a transient temperature condition.

4,944,036

SIGNATURE FILTER SYSTEM

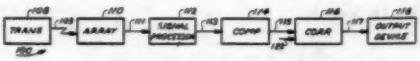
Gilbert P. Hyatt, 7841 Jennifer Circle, La Palma, Calif. 90623

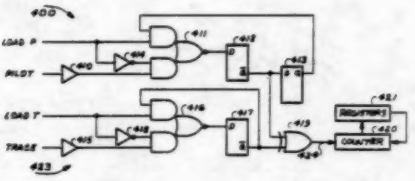
Continuation-in-part of Ser. No. 425,131, Sep. 27, 1982, Pat. No. 4,686,655, which is a continuation-in-part of Ser. No. 160,872, Jun. 19, 1980, Pat. No. 4,491,930, and a continuation-in-part of Ser. No. 860,257, Dec. 14, 1977, Pat. No. 4,371,923, said Ser. No. 160,872, is a continuation-in-part of Ser. No. 101,881, Dec. 28, 1970, and a continuation-in-part of Ser. No. 134,958, Apr. 19, 1971, and a continuation-in-part of Ser. No. 135,040, Apr. 19, 1971, and a continuation-in-part of Ser. No. 229,213, Apr. 13, 1972, Pat. No. 3,820,894, and a continuation-in-part of Ser. No. 230,872, Mar. 1, 1972, Pat. No. 4,531,182, and a continuation-in-part of Ser. No. 232,459, Mar. 7, 1972, Pat. No. 4,370,720, and a continuation-in-part of Ser. No. 246,867, Apr. 24, 1972, Pat. No. 4,310,878, and a continuation-in-part of Ser. No. 288,247, Sep. 11, 1972, Pat. No. 4,121,284, and a continuation-in-part of Ser. No. 291,394, Sep. 22, 1972, Pat. No. 4,396,976, and a continuation-in-part of Ser. No. 302,771, Nov. 1, 1972, and a continuation-in-part of Ser. No. 325,941, Jan. 22, 1973, Pat. No. 4,060,848, and a continuation-in-part of Ser. No. 366,741, Jun. 4, 1973, Pat. No. 3,986,922, and a continuation-in-part of Ser. No. 339,817, Mar. 9, 1973, Pat. No. 4,034,276, and a continuation-in-part of Ser. No. 490,816, Jul. 22, 1974, Pat. No. 4,029,853, and a continuation-in-part of Ser. No. 476,743, Jun. 5, 1974, Pat. No. 4,364,110, and a continuation-in-part of Ser. No. 522,559, Nov. 11, 1974, Pat. No. 4,209,852, and a continuation-in-part of Ser. No. 550,231, Feb. 14, 1975, Pat. No. 4,209,843, and a continuation-in-part of Ser. No. 727,330, Sep. 27, 1976, abandoned, and a continuation-in-part of Ser. No. 730,756, Oct. 7, 1976, abandoned, and a continuation-in-part of Ser. No. 754,660, Dec. 27, 1976, Pat. No. 4,486,850, and a continuation-in-part of Ser. No. 752,240, Dec. 20, 1976, abandoned, and a continuation-in-part of Ser. No. 801,879, May 13, 1977, Pat. No. 4,144,582, and a continuation-in-part of Ser. No. 812,285, Jun. 1, 1977, Pat. No. 4,371,953, and a continuation-in-part of Ser. No. 844,765, Oct. 25, 1977, Pat. No. 4,523,290, and a continuation-in-part of Ser. No. 849,812, Nov. 9, 1977, and a continuation-in-part of Ser. No. 860,278, Dec. 13, 1977, Pat. No. 4,471,385, and a continuation-in-part of Ser. No. 889,301, Mar. 23, 1978, Pat. No. 4,322,819. This application Aug. 10, 1987, Ser. No. 84,718

The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.

Int. Cl.[5] G01V *1/00*; G06J *1/00*

U.S. Cl. 367—43 47 Claims





4. A filtering system comprising:

a plurality of signature signal generators each generating a signature signal having a signature that is different from the signature of the signature signal of each of the other signature signal generators;

a combiner coupled to said plurality of signature signal generators and generating a combined signature signal by combining the signature signals generated by said plurality of signature signal generators;

a transmitter coupled to said combiner and transmitting the

combined signature signal through a propagation medium; and

a signature signal processor being spaced apart from said transmitter and generating output signal samples by processing the combined signature signal transmitted by said transmitter, said signature signal processor including

(a) a receiver generating single bit resolution input signature signal samples in response to receiving the combined signature signal transmitted by said transmitter,

(b) a plurality of single bit resolution reference signal generators each corresponding to one of said signature signal generators included in said plurality of signature signal generators and each generating single bit resolution reference signal samples having a signature that is different from the signature of the single bit resolution reference signal samples generated by each of the other single bit resolution reference signal generators and having a signature that is the same as the signature of one of the signature signals generated by the corresponding one of said plurality of signature signal generators, and

(c) a plurality of filter processors each coupled to said receiver and each corresponding to and coupled to the corresponding one of said single bit resolution reference signal generators and each generating output signal samples by filter processing the single bit resolution input signature signal samples in response to the single bit resolution reference signal samples generated by the corresponding one of the single bit resolution reference signal generators.

4,944,037

OPTICAL SYSTEM FOR RECORDING INFORMATION IN ERASABLE AND NON-ERASABLE MODES

Hideo Ando, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 819,706, Jan. 17, 1986, abandoned. This application Nov. 25, 1987, Ser. No. 125,815

Claims priority, application Japan, Jan. 18, 1985, 60-6757; Mar. 8, 1985, 60-46019; Mar. 27, 1985, 60-62324

Int. Cl.[5] G11B *13/04, 11/12*

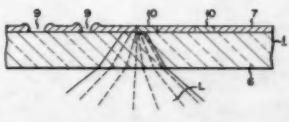
U.S. Cl. 369—13 **9 Claims**

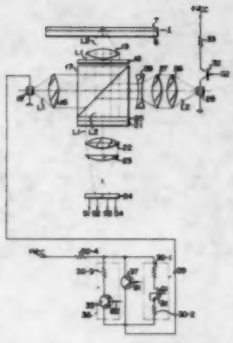
1. An optical system for recording information on an erasable recording medium, comprising:

a laser diode for selectively emitting first, second and third light beams having different first, second and third intensity levels;

means for directing the light beams from said laser diode toward said recording medium; and

means for selectively generating first, second and third energizing current signals having different levels, to energize said laser diode, which includes a current source, first, second and third switching elements connected between said laser diode and the current source, and resistors connected to the second and third switching elements, the first, second and third switching elements being selectively closed to supply one of the first, second and third energizing current signals to said laser diode the first energizing current signal being supplied to said laser diode to cause said laser diode to emit the first beam so as to form a permanent recording region on said recording





medium, the second energizing current signal being supplied to said laser diode to cause said laser diode to emit the second light beam so as to form an erasable recording region, and the third energizing current signal being supplied to said laser diode to cause said laser diode to emit the third light beam so as to retrieve information from the permanent recording region and the erasable recording region.

4,944,038

METHOD AND APPARATUS FOR UTILIZATION OF DUAL LATENCY STATIONS FOR PERFORMANCE IMPROVEMENT OF TOKEN RING NETWORKS

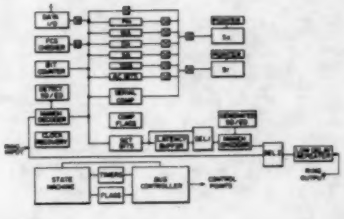
R.H. Stephen Hardy, North Vancouver, and Ian R. Radziejewski, Coquitlam, both of Canada, assignors to Simon Fraser University, Burnaby, Canada

Filed May 31, 1988, Ser. No. 201,073

Claims priority, application Canada, Jun. 1, 1987, 538535

Int. Cl.[5] H04J *3/16*

U.S. Cl. 370—85.5 **6 Claims**



1. A method of reducing station latency in a token ring network having a bus for sequentially transmitting encoded, addressable tokens between a plurality of individually addressable network stations connected to said bus, said method comprising performing, upon receipt of a token at any of said stations, the steps of:

(a) determining whether said receiving station has a message waiting for transmission on said bus;

(b) if said receiving station does have a message waiting for transmission on said bus, decoding said received token for use by said receiving station; and,

(c) if said receiving station does not have a message waiting for transmission on said bus, recoupling said received token onto said bus for transmission to the next sequential network station;

wherein said received token includes one or more flags for indicating the availability of said token for message transmission, said method further comprising, in step (c), prior to recoupling of said token onto said bus, clearing said flags.

DESIGN PATENTS

GRANTED JUL. 24, 1990

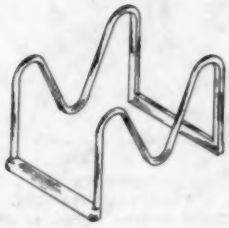
ERRATA

For CLASS	See PATENT NO.
D06-390	309,422
D15-133	309,466
D23-209	309,487
D21-075	309,501
D28-016	309,510
D28-133	309,511

DESIGNS

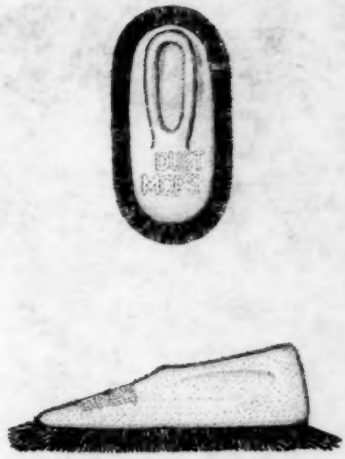
JULY 24, 1990

309,365
TACO HOLDER
Wallace C. Keene, One Beach Dr. SE., Ste. 2312, St. Petersburg, Fla. 33701
Filed Mar. 11, 1987, Ser. No. 24,400
Term of patent 14 years
U.S. Cl. D7—504

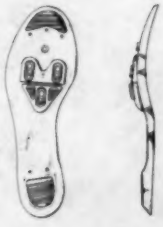


309,366
SANDWICH COOKIE
Juan F. Concepcion, Brooklyn, N.Y.; Michael P. Lucas, Ridgewood, N.J.; Robert Tabor, New York, N.Y., and Richard B. Gerstman, Tenafly, N.J., assignors to Nabisco Brands, Inc., East Hanover, N.J.
Division of Ser. No. 731,491, May 7, 1985, Pat. No. Des. 298,280. This application Jun. 20, 1988, Ser. No. 208,632
Term of patent 14 years
U.S. Cl. D1—106

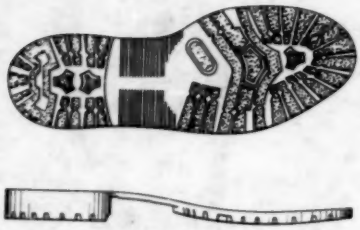
309,367
SLIPPER
Earl F. Bayer, 23 Dahlia Rd., Somerset, N.J. 08873
Filed May 20, 1987, Ser. No. 51,821
Term of patent 14 years
U.S. Cl. D2—304



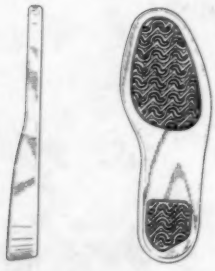
309,368
SHOE SOLE
Shigeyuki Mitsui, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Jul. 15, 1988, Ser. No. 219,134
Claims priority, application Japan, Jan. 16, 1988, 63-1312
Term of patent 14 years
U.S. Cl. D2—317



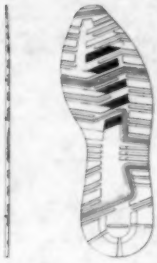
309,369
SHOE SOLE
James E. Issler, Westport, Conn., assignor to H. H. Brown Shoe Company, Inc., New York, N.Y.
Filed Mar. 18, 1988, Ser. No. 170,412
Term of patent 14 years
U.S. Cl. D2—320



309,370
SHOE SOLE
Terushige Nagai, Kako, and Shinsuke Inoue, Kobe, both of Japan, assignors to Asics Corporation, Kobe, Japan
Filed Jul. 15, 1988, Ser. No. 219,135
Claims priority, application Japan, Jan. 16, 1988, 63-1313
Term of patent 14 years
U.S. Cl. D2—320

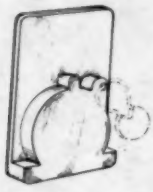


309,371
SHOE SOLE
Toshikazu Kayano, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Sep. 26, 1988, Ser. No. 249,090
Claims priority, application Japan, Mar. 30, 1988, 63-12873
Term of patent 14 years
U.S. Cl. D2—320



309,372
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Filed Jul. 5, 1988, Ser. No. 215,887
Term of patent 14 years
U.S. Cl. D3—12

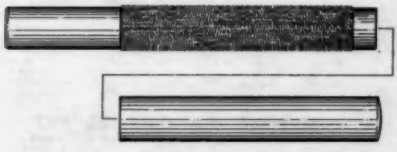
309,373
RETRACTABLE KEY HOLDER
Paul Appelbaum, Box 27006, Denver, Colo. 80227
Filed Mar. 14, 1989, Ser. No. 323,558
Term of patent 14 years
U.S. Cl. D3—61



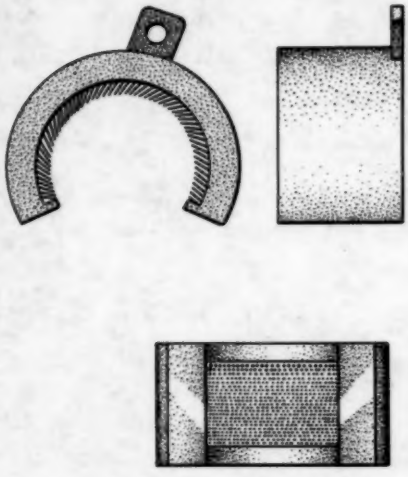
309,374
GUN AND HANDCUFF HOLSTER
Charles R. Lightfoot, 584 Myrtle Ave., Brooklyn, N.Y. 11216
Filed Oct. 31, 1988, Ser. No. 264,673
Term of patent 14 years
U.S. Cl. D3—101

309,375
TOOTHBRUSH
Tom E. T. Ahlstroem, and Hans O. G. Ehrich, both of Stockholm, Sweden, assignors to Colgate-Palmolive Company, Piscataway, N.J.
Filed Mar. 24, 1988, Ser. No. 172,920
Term of patent 14 years
U.S. Cl. D4—104

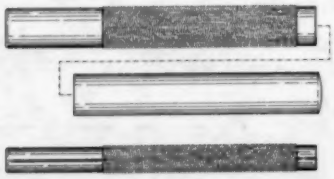
309,376
BRUSH FOR REMOVING LINT
Larry J. Kiesz, 12700 SE. Hubbard Rd., Clackamas, Oreg. 97015
Filed Jun. 8, 1987, Ser. No. 59,389
Term of patent 14 years
U.S. Cl. D4—128



309,377
HAND HELD FLEXIBLE BRUSH FOR CLEANING ELECTRICAL TERMINALS OF VARYING SIZE
Carl J. Taylor, and Robert L. Whaley, both of Cincinnati, Ohio, assignors to Bardes Corporation, Cincinnati, Ohio
Filed May 15, 1987, Ser. No. 49,784
Term of patent 14 years
U.S. Cl. D4—130

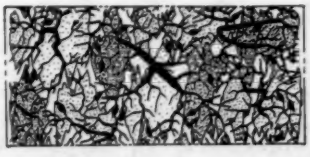


309,378
BRUSH FOR REMOVING LINT
Larry J. Kiesz, 12700 SE. Hubbard Rd., Clackamas, Oreg. 97015
Filed Jun. 8, 1987, Ser. No. 59,388
Term of patent 14 years
U.S. Cl. D4—128



309,379
HANDLE FOR UTILITY BRUSHES
Robert Dawes, Brisbane, Australia, assignor to Trevor John Turner and Kaylene Gail Turner, Granville, Australia
Filed Jun. 26, 1987, Ser. No. 66,643
Claims priority, application Australia, Apr. 28, 1987, 1437/87
Term of patent 14 years
U.S. Cl. D4—138

309,380
CAMOUFLAGE PATTERN
Marc A. Barger, 2904 6th Ave., and Jason Dannenberg, 3226 Laurel Ave., both of Sioux City, Iowa 51106
Filed Jun. 20, 1988, Ser. No. 209,023
Term of patent 14 years
U.S. Cl. D5—62



309,381
SWIVEL CHAIR
Randall P. Buhk, Wyoming, Mich., assignor to Allsteel Inc., Aurora, Ill.
Filed Apr. 23, 1987, Ser. No. 43,260
Term of patent 14 years
U.S. Cl. D6—360

309,382
SWIVEL ARM CHAIR
Randall P. Buhk, Wyoming, Mich., assignor to Allsteel Inc., Aurora, Ill.
Filed Apr. 23, 1987, Ser. No. 42,872
Term of patent 14 years
U.S. Cl. D6—360

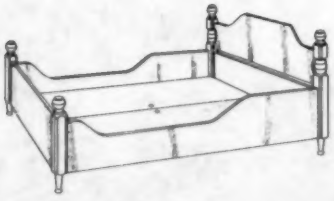
309,383
CHAIR SEAT
Wolfgang Muller-Deisig, Natzungen, Fed. Rep. of Germany; David C. Jenkins; Terry D. West, both of Grand Rapids, Mich., and Zooey C. Chu, Holland, Mich., assignors to Steelcase, Inc., Grand Rapids, Mich.
Continuation-in-part of Ser. No. 818,678, Jan. 14, 1986. This application May 15, 1986, Ser. No. 864,960
Term of patent 14 years
U.S. Cl. D6—366

309,384
SEAT
Randall P. Buhk, Wyoming, Mich., assignor to Allsteel Inc., Aurora, Ill.
Filed Apr. 23, 1987, Ser. No. 41,748
Term of patent 14 years
U.S. Cl. D6—366

309,385
SEAT
Randall P. Buhk, Wyoming, Mich., assignor to Allsteel Inc., Aurora, Ill.
Filed Apr. 23, 1987, Ser. No. 42,967
Term of patent 14 years
U.S. Cl. D6—366

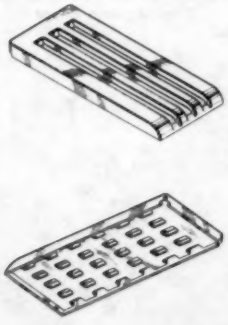
309,386
ARM CHAIR
Randall P. Buhk, Wyoming, Mich., assignor to Allsteel Inc., Aurora, Ill.
Filed Apr. 23, 1987, Ser. No. 42,871
Term of patent 14 years
U.S. Cl. D6—379

309,387
CHILD'S BED
Donald F. Marshall, P.O. Box 234, No. Bridgton, Me. 04057
Filed Oct. 24, 1986, Ser. No. 923,651
Term of patent 14 years
U.S. Cl. D6—394

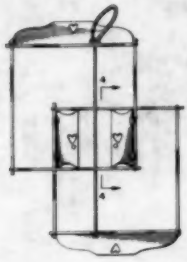


309,388
VANITY TABLE
Peter M. Yau Kee, Happy Valley, Hong Kong, assignor to Rosalco, Inc., Louisville, Ky.
Filed Mar. 10, 1989, Ser. No. 322,223
Term of patent 14 years
U.S. Cl. D6—397

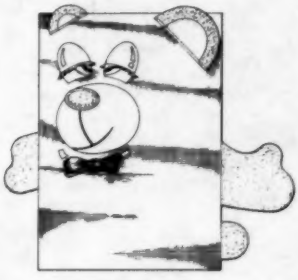
309,389
STORAGE SHELF
Jack K. Hockenberry, Owatonna, Minn., assignor to Wenger Corporation, Owatonna, Minn.
Filed Jul. 16, 1987, Ser. No. 74,434
Term of patent 14 years
U.S. Cl. D6—511



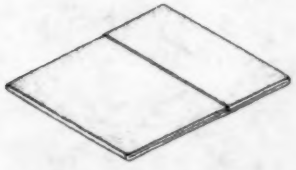
309,390
HANGING DISPLAY SHELF
Henry L. Smith, Klondike Resort, Rte. 8, Otis, Mass. 01253
Filed Jun. 6, 1988, Ser. No. 202,995
Term of patent 14 years
U.S. Cl. D6—571



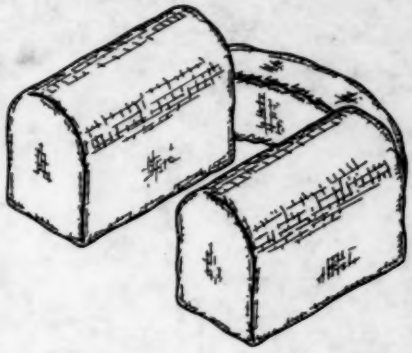
309,391
PILLOWCASE
Robert O. King, and Glenn E. Collins, both of Mechanicsville, Va., assignors to Today's Child, Inc., Mechanicsville, Va.
Filed Mar. 28, 1988, Ser. No. 174,025
Term of patent 14 years
U.S. Cl. D6—601



309,392
COVER FOR AN INFLATABLE BEACH PILLOW
Philip A. Hafvenstein, 5609 27th Ave. S., Minneapolis, Minn. 55417, and Paul C. Heeren, 17130 Franchise Way, Farmington, Minn. 55024
Filed Dec. 12, 1986, Ser. No. 941,291
Term of patent 14 years
U.S. Cl. D6—601

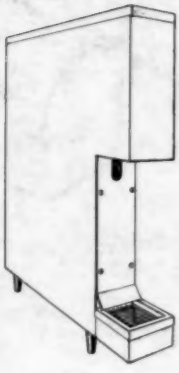


309,393
CAR SEAT PILLOW
Margie C. Talaugon, 615 Solano Ave., Sonoma, Calif. 95476
Filed May 5, 1988, Ser. No. 190,515
Term of patent 14 years
U.S. Cl. D6—601

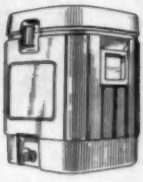


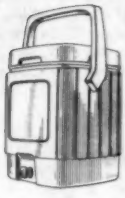
309,394
THERMALIZED CHILDREN'S CAR SEAT CUSHION
Suzanne P. Morris, 3402-C Prince David Dr., Richmond, Va. 23223
Filed Dec. 3, 1987, Ser. No. 128,508
Term of patent 14 years
U.S. Cl. D6—611

309,395
JUICE DISPENSER
George L. Thompson, Snellville; Kenneth G. Smazik, and Jonathan Kirschner, both of Marietta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Oct. 29, 1986, Ser. No. 924,532
Term of patent 14 years
U.S. Cl. D7—311

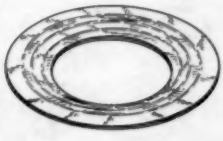


309,396
COOLER
Gene Lundblade, Valley Center, and Robert Deines, Wichita, both of Kans., assignors to Coleman Outdoor Products, Inc., Wichita, Kans.
Filed Aug. 12, 1987, Ser. No. 84,121
Term of patent 14 years
U.S. Cl. D7—313





309,397
PIZZA GRIDDLE
Everett D. Strand, 4317 Dupont Ave. S., Minneapolis, Minn. 55409
Filed Mar. 19, 1987, Ser. No. 27,671
Term of patent 14 years
U.S. Cl. D7—354

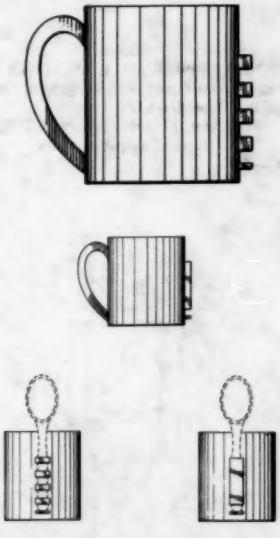


309,398
CAP FOR A GAS BURNER
Lyle B. Land, Geneva, Ill., assignor to Harper-Wyman Company, Lisle, Ill.
Filed Jan. 21, 1988, Ser. No. 146,358
Term of patent 14 years
U.S. Cl. D7—407

309,399
AGITATOR FOR A FOOD MIXER
John K. Barnard, Bay Village, and David A. Brown, Rocky River, both of Ohio, assignors to Vita-Mix Corporation and Flurry International, Inc., both of Cleveland, Ohio
Filed May 21, 1987, Ser. No. 52,764
Term of patent 14 years
U.S. Cl. D7—412

309,400
ICE CREAM AGITATOR
John K. Barnard, Bay Village, Ohio, assignor to Vita-Mix Corporation, Cleveland, Ohio
Filed Jun. 27, 1988, Ser. No. 211,668
Term of patent 14 years
U.S. Cl. D7—412

309,401
CUP WITH SPOON HOLDER
Marie Lombardi, 816 NW. 28th St., Wilton Manors, Fla. 33311
Filed Jan. 29, 1988, Ser. No. 150,329
Term of patent 14 years
U.S. Cl. D7—507



309,402

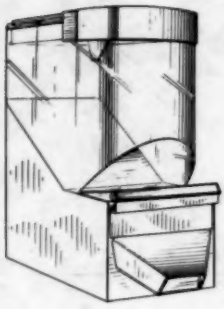
BEAN DISPENSER

Lester Morrow, Ossining, N.Y., assignor to Marlboro Marketing, Inc., New York, N.Y.

Filed Jun. 3, 1988, Ser. No. 202,181

Term of patent 14 years

U.S. Cl. D7—589



309,403

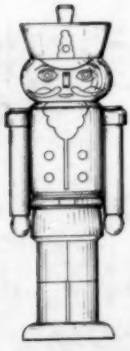
COMBINED PEPPER MILL AND SALT SHAKER

John W. Pierotti, Smethport, Pa., assignor to Chef Specialities Company, Inc., Smethport, Pa.

Filed Mar. 31, 1988, Ser. No. 175,729

Term of patent 14 years

U.S. Cl. D7—594



309,404

COMBINED PEPPER MILL AND SALT SHAKER

John W. Pierotti, Smethport, Pa., assignor to Chef Specialities Company, Inc., Smethport, Pa.

Filed Mar. 31, 1988, Ser. No. 175,730

Term of patent 14 years

U.S. Cl. D7—594

309,405

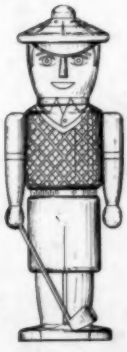
COMBINED PEPPER MILL AND SALT SHAKER

John W. Pierotti, Smethport, Pa., assignor to Chef Specialities Company, Inc., Smethport, Pa.

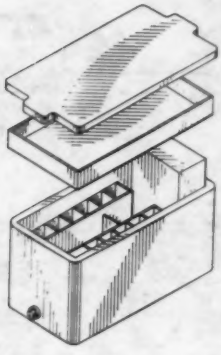
Filed Mar. 31, 1988, Ser. No. 175,733

Term of patent 14 years

U.S. Cl. D7—594

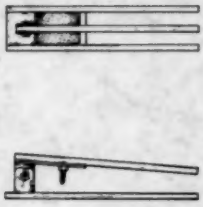


309,406
OFF ROAD VEHICLE ICE CHEST
Lee J. Ridings, 712 Flamingo Dr., Apollo Beach, Fla. 33570
Filed Sep. 30, 1987, Ser. No. 102,898
Term of patent 14 years
U.S. Cl. D7—605



309,407
COMBINED CHOPPING BLOCK WITH KNIVES, STORAGE, AND LOCKING SYSTEM
Joyce R. May, P.O. Box 30504, Lafayette, La. 70503
Filed Jul. 7, 1987, Ser. No. 70,507
Term of patent 14 years
U.S. Cl. D7—638

309,408
OYSTER OPENER
Donald J. Bell, Pahokee, Fla., assignor to Don Bell Enterprises, Inc., Wellington, Fla.
Filed Nov. 28, 1986, Ser. No. 936,030
Term of patent 14 years
U.S. Cl. D7—693



309,409
PAIR OF TOOL HANDLES
Vincent J. Kiernan, Hudson, Ohio, assignor to Baren Group, Chagrin Falls, Ohio
Filed Mar. 28, 1988, Ser. No. 174,017
Term of patent 14 years
U.S. Cl. D8—4

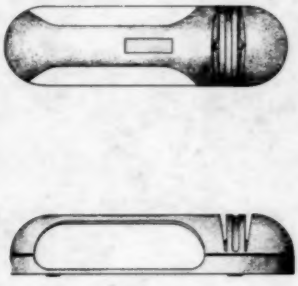
309,410
SAFETY ALIGNING PIN
Samuel Albert, 637 Adams Ave., Philadelphia, Pa. 19120
Filed Aug. 27, 1987, Ser. No. 90,773
Term of patent 14 years
U.S. Cl. D8—14

309,411
OPEN-ENDED WRENCH
Bruce L. Strock, 3046 Camino Graciosa St., Thousand Oaks, Calif. 91360
Filed Mar. 10, 1987, Ser. No. 27,024
Term of patent 14 years
U.S. Cl. D8—17

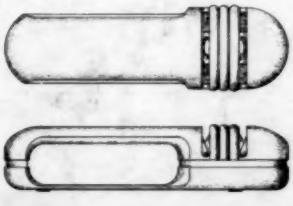
309,412
STAPLE REMOVER
Jane Ancona, and Bruce Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jan. 27, 1989, Ser. No. 303,560
Term of patent 14 years
U.S. Cl. D8—48

309,413
SCISSORS
Jane Ancona, and Bruce Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jan. 27, 1989, Ser. No. 303,559
Term of patent 14 years
U.S. Cl. D8—57

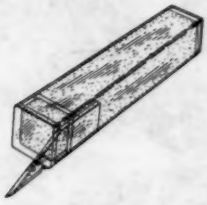
309,414
KNIFE SHARPENER
Kiyoshi Shimizu, 3-7-75, Suehiro, Miki-city Hyogo, Japan
Filed Apr. 11, 1988, Ser. No. 180,017
Claims priority, application Japan, Oct. 29, 1987, 62-44294
Term of patent 14 years
U.S. Cl. D8—93

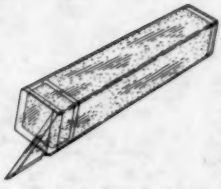


309,415
KNIFE SHARPENER
Kiyoshi Shimizu, 3-7-75, Suehiro, Miki-city Hyogo, Japan
Filed Apr. 11, 1988, Ser. No. 180,018
Claims priority, application Japan, Oct. 29, 1987, 62-44293
Term of patent 14 years
U.S. Cl. D8—93



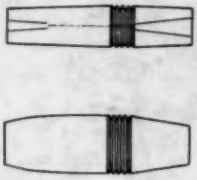
309,416
COMBINED CONTAINER WITH MINERALS AND LETTER OPENER
Gordon D. Britz, 2518 Kilpatrick Ct., San Ramon, Calif. 94853
Filed Nov. 25, 1987, Ser. No. 125,072
Term of patent 14 years
U.S. Cl. D8—104





309,417
STRIKER PLATE FOR AN AUTOMOBILE DOOR LOCK
Shinjiro Yamada, Utsunomiya, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 4, 1988, Ser. No. 253,429
Claims priority, application Japan, Apr. 7, 1988, 63-13998
Term of patent 14 years
U.S. Cl. D8—345

309,418
SPRAY DISPENSER
Reinold Geiger, St. Germain En Laye, France, assignor to A.M.S. Packaging, Saint-Ouen-L'Aumone, France
Filed Sep. 30, 1987, Ser. No. 103,103
Term of patent 14 years
U.S. Cl. D9—300

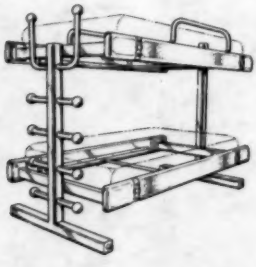


309,419
BAG
Catherine L. Berg, 9131 Emerson St., Thornton, Colo. 80229
Filed Sep. 12, 1986, Ser. No. 906,785
Term of patent 14 years
U.S. Cl. D9—305

309,420
BOTTLE
Theodore L. Beaver, Roselle, Ill., assignor to The Clorox Company, Oakland, Calif.
Filed Oct. 7, 1986, Ser. No. 916,670
Term of patent 14 years
U.S. Cl. D9—376

309,421
BOTTLE
Thomas B. Aldrich, III, Spring Valley, N.Y., assignor to Bristol-Myers Canada Inc., Toronto, Canada
Filed Aug. 12, 1987, Ser. No. 85,091
Claims priority, application Canada, Feb. 26, 1987, 2602872
Term of patent 14 years
U.S. Cl. D9—376

309,422
BUNK BED
Brent W. Zitting, 4271 S. Charles Dr., West Valley City, Utah 84120
Filed Feb. 2, 1987, Ser. No. 9,906
Term of patent 14 years
U.S. Cl. D6—390



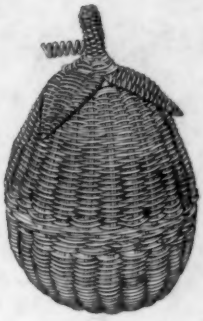
309,423
BOTTLE AND CAP
Michel Alizard, Orgeval, France, assignor to Colgate-Palmolive Company, Piscataway, N.J.
Filed Sep. 9, 1988, Ser. No. 244,451
Term of patent 14 years
U.S. Cl. D9—404

309,424
WICKER CONTAINER
Barbara A. Grimm, Baguio Villa, Block 26, 25 Floor, Flat C, 555 Victoria Road, Hong Kong, Hong Kong
Filed Jun. 27, 1988, Ser. No. 211,685
Term of patent 14 years
U.S. Cl. D9—414

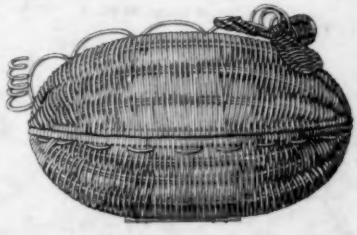
309,425
WICKER CONTAINER
Barbara A. Grimm, Baguio Villa, Block 26, 25 Floor, Flat C, 555 Victoria Road, Hong Kong, Hong Kong
Filed Jun. 27, 1988, Ser. No. 211,686
Term of patent 14 years
U.S. Cl. D9—414

309,426
WICKER CONTAINER
Barbara A. Grimm, Block 26, 25 Floor, Flat C, 555 Victoria Road, Baguio Villa, Hong Kong
Filed Jun. 27, 1988, Ser. No. 211,687
Term of patent 14 years
U.S. Cl. D9—414

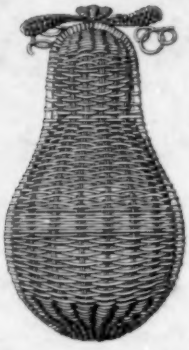
309,427
WICKER CONTAINER
Barbara A. Grimm, Block 26, 25 Floor, Flat C, 555 Victoria Road, Baguio Villa, Hong Kong
Filed Jun. 27, 1988, Ser. No. 211,688
Term of patent 14 years
U.S. Cl. D9—414



309,428
WICKER CONTAINER
Barbara A. Grimm, Block 26, 25 Floor, Flat C, 555 Victoria Road, Baguio Villa, Hong Kong
Filed Jun. 27, 1988, Ser. No. 211,690
Term of patent 14 years
U.S. Cl. D9—414



309,429
WICKER CONTAINER
Barbara A. Grimm, Block 26, 25 Floor, Flat C, 555 Victoria Road, Baguio Villa, Hong Kong
Filed Jun. 27, 1988, Ser. No. 211,689
Term of patent 14 years
U.S. Cl. D9—414

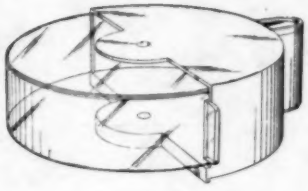


309,430
CONTAINER
Ronald G. Cramer, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Mar. 24, 1988, Ser. No. 172,746
Term of patent 14 years
U.S. Cl. D9—415

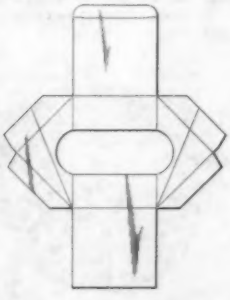
309,431
CANDY BOX AND THE LIKE
Timothy K. Sheehan, Smyrna, Ga., assignor to Amoco Corporation, Chicago, Ill.
Filed Aug. 14, 1987, Ser. No. 85,605
Term of patent 14 years
U.S. Cl. D9—424

309,432
CONTAINER
Derek V. Mancini, Uxbridge, Canada, assignor to Twinpak, Inc., Dorval, Canada
Filed Sep. 3, 1987, Ser. No. 92,705
Term of patent 14 years
U.S. Cl. D9—424

309,433
CONTAINER FOR PLATES
Furio Minuti, Macerata, Italy, assignor to Fratelli Guzzini, S.p.A., Recanati, Italy
Filed Aug. 3, 1987, Ser. No. 80,705
Claims priority, application Italy, Feb. 4, 1987, 20733 B/87
Term of patent 14 years
U.S. Cl. D9—424



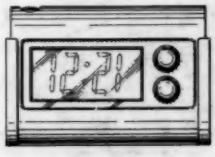
309,434
BLANK FOR A CONTAINER
Neil V. H. Goldman, London, England, assignor to Frank Coleman (Luton) Limited, Flitwick, England
Filed Apr. 8, 1988, Ser. No. 179,133
Claims priority, application United Kingdom, Oct. 12, 1987, 87/1045542
Term of patent 14 years
U.S. Cl. D9—433



309,435
CAP FOR AN AEROSOL CONTAINER
Kenneth T. Sharman, and Bruce H. Dawson, both of Ajax, Canada, assignors to PVC (Canada), Ltd., Ajax and CCL Industries, Inc., Toronto, both of, Canada
Filed Feb. 9, 1987, Ser. No. 12,199
Term of patent 14 years
U.S. Cl. D9—435

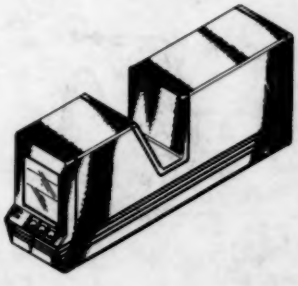
309,436
COMBINED CLOCK AND BANK
Hans K. Zeisel, Waiblinger Strasse 25, D-7054 Korb, Fed. Rep. of Germany
Filed May 21, 1987, Ser. No. 52,746
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 61-1107
Term of patent 14 years
U.S. Cl. D10—2

309,437
COMBINED CLOCK AND FLASHLIGHT
Kam W. Ng, Kowloon, Hong Kong, assignor to Silcon Electronics Company Limited, Hong Kong, Hong Kong
Filed Sep. 9, 1986, Ser. No. 905,948
Claims priority, application United Kingdom, Mar. 17, 1986, 1032877
Term of patent 14 years
U.S. Cl. D10—5

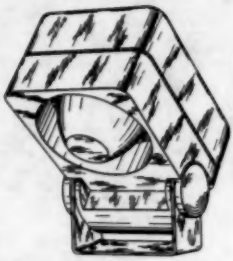


309,438
WRISTWATCH
Hans Saurer, Lugano, Switzerland, assignor to Christian Dior, S.A., Paris, France
Filed May 14, 1987, Ser. No. 50,211
Term of patent 14 years
U.S. Cl. D10—39

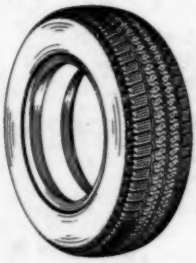
309,439
NON-CONTACT OPTICAL GAUGE
Kurt Goszyk, Washington Crossing, Pa., assignor to Contrologic, Inc., Norristown, Pa.
Filed Jul. 18, 1988, Ser. No. 220,829
Term of patent 14 years
U.S. Cl. D10—46



309,440
SIREN FOR AUTOMOBILES AND THE LIKE
Giovanni Arduini; Lorenzo Bonfanti, and Gianfranco Salvemini, all of Milan, Italy, assignors to Delta Elettronica S.p.A., Varese, Italy
Filed Sep. 30, 1987, Ser. No. 103,265
Claims priority, application Italy, May 18, 1987, 60920 B/87
Term of patent 14 years
U.S. Cl. D10—120



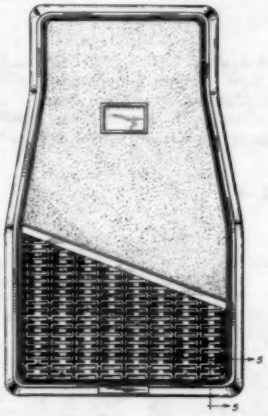
309,441
AUTOMOBILE TIRE
Hiroaki Sakuno, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Nov. 16, 1987, Ser. No. 120,810
Claims priority, application Japan, May 15, 1987, 62-19214
Term of patent 14 years
U.S. Cl. D12—147



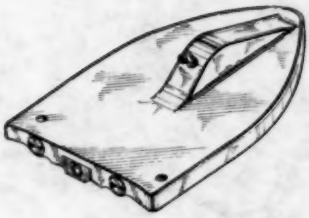
309,442
VEHICLE TIRE
Kenichi Okada, Hyogo, Japan, assignor to The Ohtsu Tire & Rubber Co., Ltd., Izumi-Ohtsu, Japan
Filed Dec. 22, 1987, Ser. No. 136,873
Claims priority, application Japan, Jul. 2, 1987, 62-27099
Term of patent 14 years
U.S. Cl. D12—147

309,443
VEHICLE TIRE
Masaaki Minamitani, Osaka, Japan, assignor to The Ohtsu Tire and Rubber Co., Ltd., Osaka, Japan
Filed Aug. 11, 1987, Ser. No. 83,998
Claims priority, application Japan, Mar. 13, 1987, 62-9676[U]
Term of patent 14 years
U.S. Cl. D12—151

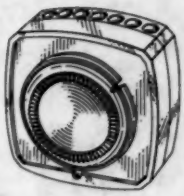
309,444
AUTOMOBILE FLOOR MAT
Pierre Charet, 12490 SW. 95 Ter., Miami, Fla. 33186, and Duke Kraai, 10055 SW. 213 Ter., Miami, Fla. 33189
Filed Dec. 23, 1987, Ser. No. 137,851
Term of patent 14 years
U.S. Cl. D12—203



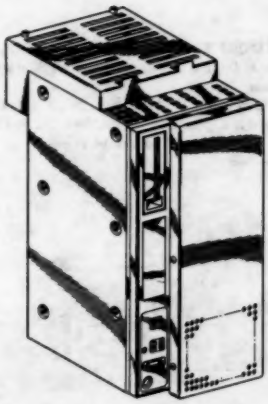
309,445
WATER VEHICLE
Howard C. Hornsby, Jr., 1221 Wynnedale Rd., West Palm Beach, Fla. 33417, and Robert J. Murphy, 1916 Pleasant Dr., Juno, Fla.
Filed Jan. 22, 1988, Ser. No. 146,796
Term of patent 14 years
U.S. Cl. D12—307



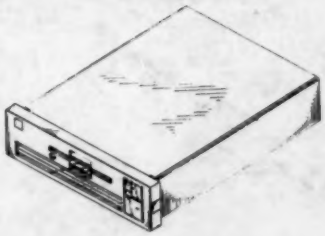
309,447
SWITCH HOUSING
Ardeshir Bandari, Brantford, Canada, assignor to Western Electrical Manufacturing Inc., Brantford, Canada
Filed Dec. 19, 1986, Ser. No. 943,963
Claims priority, application Canada, Jun. 19, 1986, 19-86-86-1
Term of patent 14 years
U.S. Cl. D13—158



309,446
MINI PROGRAMMABLE LOGIC CONTROLLER
Walter M. Russell, Houston, Tex., assignor to Square D Company, Palatine, Ill.
Filed Apr. 8, 1988, Ser. No. 179,008
Term of patent 14 years
U.S. Cl. D13—162



309,448
DISK DRIVE
Wayne L. Aderman, Zumbro Falls, Minn.; Willis Y. Jordan, Birmingham, Ala.; Timothy J. Rodd, Lyndhurst, England, and Robert P. Tennant, Endicott, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Mar. 28, 1988, Ser. No. 174,479
Term of patent 14 years
U.S. Cl. D14—109



309,449

CURSOR CONTROL FOR A DIGITIZING TABLE

Lindsay W. MacDonald, Bedfordshire; Robert G. Buxton, Knutsford, and Peter Grayson, Manchester, all of England, assignors to Crosfield Electronics Limited, London, United Kingdom

Filed Jul. 22, 1988, Ser. No. 223,197

Claims priority, application United Kingdom, Jan. 22, 1988, 1047863

Term of patent 14 years

U.S. Cl. D14—114

309,450

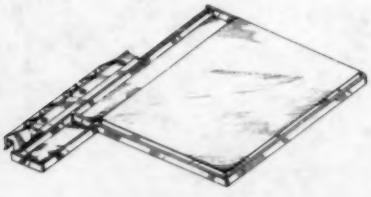
COMPUTER MOUSE PAD

H. Charles Hassel, Los Angeles; Kenneth Geist, Beverely Hills, and Gregory Du Vall, Santa Monica, all of Calif., assignors to MicroComputer Accessories, Inc., Los Angeles, Calif.

Filed Jul. 27, 1988, Ser. No. 224,861

Term of patent 14 years

U.S. Cl. D14—114



309,451

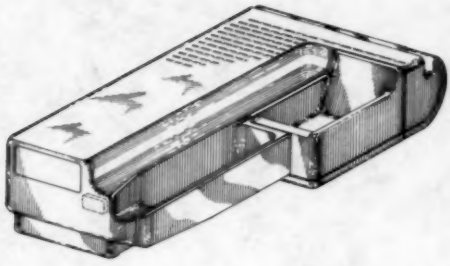
PORTABLE RADIOTELEPHONE OR SIMILAR ARTICLE

Albert L. Nagele, Wilmette, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 15, 1988, Ser. No. 146,143

Term of patent 14 years

U.S. Cl. D14—137



309,452

COMBINED TAPE RECORDER AND RADIO

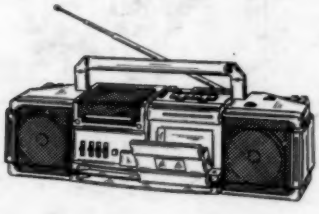
Mitsutaka Fuke, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan

Filed Mar. 22, 1988, Ser. No. 171,531

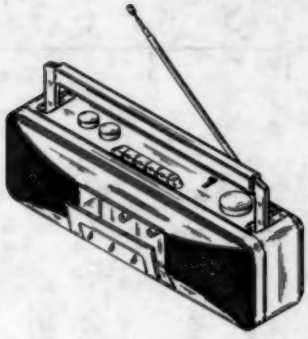
Claims priority, application Japan, Sep. 28, 1987, 62-39871

Term of patent 14 years

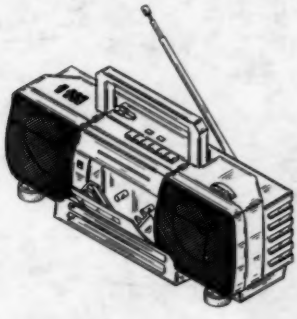
U.S. Cl. D14—163



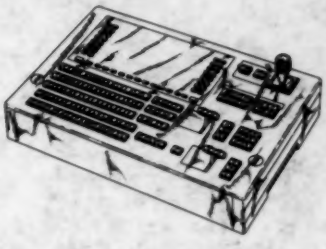
309,453
COMBINED TAPE RECORDER AND RADIO
Tatsuo Mori, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 12, 1988, Ser. No. 180,807
Claims priority, application Japan, Oct. 30, 1987, 62-44575
Term of patent 14 years
U.S. Cl. D14—163



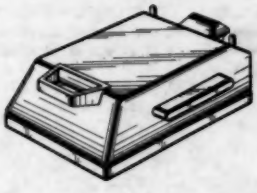
309,454
COMBINED TAPE RECORDER AND RADIO
Tatsuo Mori, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 8, 1988, Ser. No. 204,183
Claims priority, application Japan, Dec. 11, 1987, 62-50841
Term of patent 14 years
U.S. Cl. D14—163

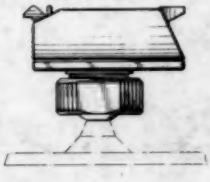


309,455
VIDEO SWITCHER
Darrell S. Staley, Santa Clara, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed Nov. 5, 1987, Ser. No. 117,729
Term of patent 14 years
U.S. Cl. D14—239

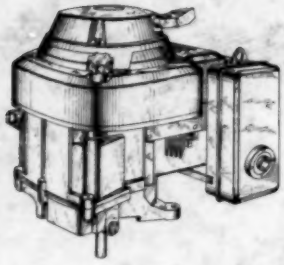


309,456
POSITIVE LOCK HANGER FOR A TELEPHONE HANDSET
Richard Culbertson, Lynchburg, Va., assignor to Ericsson GE Mobile Communications Inc., Lynchburg, Va.
Filed Aug. 22, 1988, Ser. No. 234,835
Term of patent 14 years
U.S. Cl. D14—253

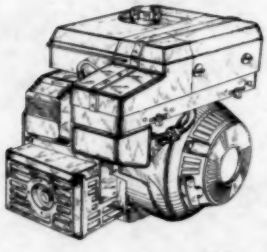




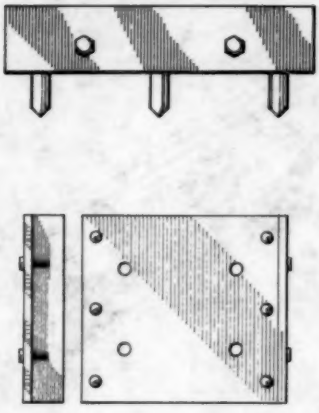
309,457
INTERNAL COMBUSTION ENGINE
Glen C. Elfert, Hartford, and Thomas J. Green, West Bend, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.
Filed Apr. 18, 1988, Ser. No. 182,744
Term of patent 14 years
U.S. Cl. D15—1



309,458
INTERNAL COMBUSTION ENGINE
Gary S. Johnson, Racine, and Thomas J. Green, West Bend, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.
Filed Apr. 18, 1988, Ser. No. 182,743
Term of patent 14 years
U.S. Cl. D15—1

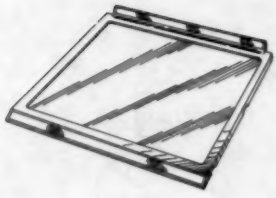


309,459
EARTH MOVING OUTRIGGER SHOE FOR FROST, ROCKS OR THE LIKE
George E. Journey, 1361 Skelp Level Rd., Downingtown, Pa. 19335
Filed Jul. 7, 1988, Ser. No. 216,260
Term of patent 14 years
U.S. Cl. D15—28

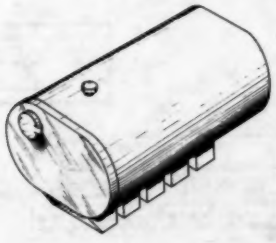


309,460
TILLAGE POINT TOOTH
Dennis M. Gross, 1702 Cleveland, Caldwell, Id. 83605
Filed May 6, 1987, Ser. No. 47,055
Term of patent 14 years
U.S. Cl. D15—29

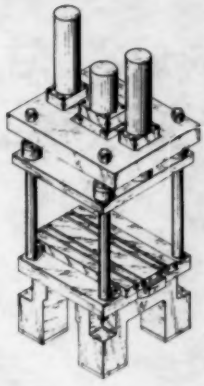
309,461
REFRIGERATOR SHELF
Marc R. Bussan, Evansville; Charles G. Fellwock, Scott Township, Vanderburgh County, both of Ind., and Jeffrey A. DeBoer, Ann Arbor, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Nov. 7, 1988, Ser. No. 267,764
Term of patent 14 years
U.S. Cl. D15—89



309,462
PORTABLE REFRIGERATED BEVERAGE DISPENSER
Algernon P. Russell, 1212 N. Robertson St., New Orleans, La. 70116
Filed May 21, 1986, Ser. No. 865,606
Term of patent 14 years
U.S. Cl. D15—90



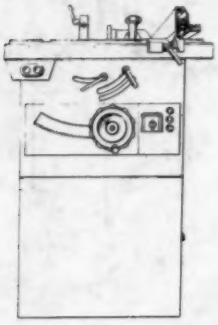
309,463
FORGING PRESS
Richard A. McDaniel, McKean, and George M. Dudick, North East, both of Pa., assignors to Efco, Inc., Erie, Pa.
Filed Mar. 28, 1988, Ser. No. 174,330
Term of patent 14 years
U.S. Cl. D15—123



309,464
TELESCOPIC BLADE GUIDE
Krister Salomonsson, Sjölyckevägen 1, S-342 00 Alvesta, Sweden
Filed Dec. 28, 1987, Ser. No. 138,021
Claims priority, application Sweden, Jun. 25, 1987, 87-1473
Term of patent 14 years
U.S. Cl. D15—133

309,465
EYE SHIELD
John P. Russell, 1000 Main St., Gardendale, Ala. 35071
Filed Jul. 28, 1987, Ser. No. 78,544
Term of patent 14 years
U.S. Cl. D16—107

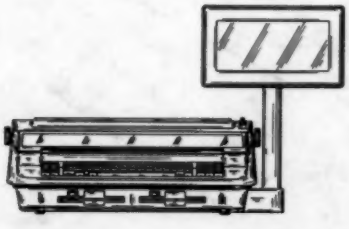
309,466
TABLE SAW
Marc Wodli, Bischheim, France, assignor to Electroli, S.A., Bischwiller, France
Filed May 4, 1988, Ser. No. 196,091
Term of patent 14 years
U.S. Cl. D15—133



309,467
COLLAPSIBLE HAND-HELD PERISCOPE
George E. Miller, Burlingame; Robert D. Brunner, Palo Alto, and Kenneth D. Wood, Menlo Park, all of Calif., assignors to Carolina Pacific, Inc., Burlingame, Calif.
Filed Oct. 12, 1988, Ser. No. 256,892
Term of patent 14 years
U.S. Cl. D16—132

309,468
ELECTRIC GUITAR
Kent T. Everett, 2735 Talluiah Dr., Atlanta, Ga. 30319
Filed Nov. 9, 1987, Ser. No. 118,631
Term of patent 14 years
U.S. Cl. D17—14

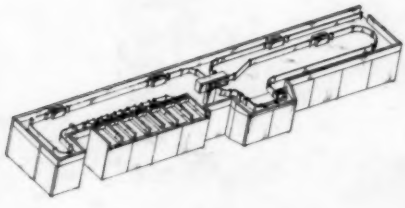
309,469
TYPEWRITER
Kuniyasu Matsumoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed May 29, 1987, Ser. No. 55,775
Claims priority, application Japan, Dec. 1, 1986, 61-47704
Term of patent 14 years
U.S. Cl. D18—2



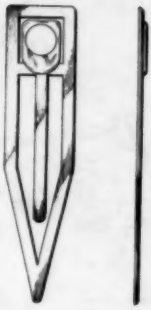
309,470
ELECTRONIC CALCULATOR WITH PRINTER
Hiroshi Sakaguchi, and Tadahiko Saimen, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Dec. 28, 1987, Ser. No. 138,690
Claims priority, application Japan, Jul. 2, 1987, 62-27320
Term of patent 14 years
U.S. Cl. D18—7

309,471
CALCULATOR CASE
Thomas Perelli, and Joseph C. Sereika, both of Stanhope, N.J., assignors to Monroe Systems for Business, Inc.
Filed Oct. 13, 1987, Ser. No. 108,306
Term of patent 14 years
U.S. Cl. D18—11

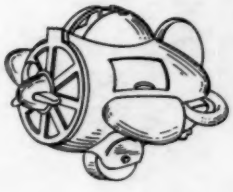
309,472
MAIL REARRANGING/STAMPING MACHINE
Yoshiaki Nishida, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 29, 1986, Ser. No. 868,346
Term of patent 14 years
U.S. Cl. D18—99



309,473
BOOKMARK
Sylvia S. Toy, P.O. Box 1125, Paradise, Calif. 95967
Filed Jul. 22, 1988, Ser. No. 223,174
Term of patent 14 years
U.S. Cl. D19—34



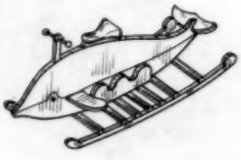
309,474
COMBINED PLURAL DESK ARTICLE UNIT AND HOLDER THEREFOR
Seishiro Murai, Tokyo, Japan, assignor to Kabushiki Kaisha Beetland, Japan
Filed Jul. 14, 1987, Ser. No. 73,416
Term of patent 14 years
U.S. Cl. D19—75



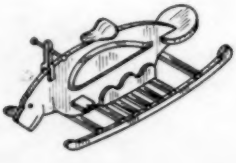
309,475
COLLIDING BALL TOY
Nasser Salehzadeh, and Dana L. Salehzadeh, both of 155 Bellvue Loop, Fayetteville, Ga. 30214
Filed Jul. 17, 1989, Ser. No. 380,276
Term of patent 14 years
U.S. Cl. D21—62

309,476
SIMULATIVE ROCKER
John G. Freiberger, Jr., 4722 Trade Winds Dr. S., Gulfport, Fla. 33711, and Kelly M. Allen, 2825 53rd St. S., Gulfport, Fla. 33707
Filed Sep. 7, 1988, Ser. No. 241,136
Term of patent 14 years
U.S. Cl. D21—69

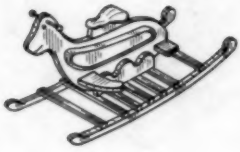
309,477
SIMULATIVE ROCKER
John G. Freiberger, Jr., 4722 Trade Winds Dr. S., Gulfport, Fla. 33711, and Kelly M. Allen, 2825 53rd St. S., Gulfport, Fla. 33707
Filed Sep. 7, 1988, Ser. No. 241,146
Term of patent 14 years
U.S. Cl. D21—69



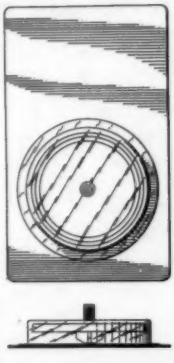
309,478
SIMULATIVE ROCKER
John G. Freiberger, Jr., 4722 Trade Winds Dr. S., Gulfport, Fla. 33711, and Kelly M. Allen, 2825 53rd St. S., Gulfport, Fla. 33707
Filed Sep. 7, 1988, Ser. No. 241,147
Term of patent 14 years
U.S. Cl. D21—69



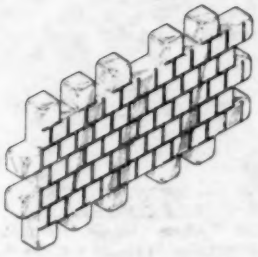
309,479
SIMULATIVE ROCKER
John G. Freiberger, Jr., 4722 Trade Winds Dr. S., Gulfport, Fla. 33711, and Kelly M. Allen, 2825 53rd St. S., Gulfport, Fla. 33707
Filed Sep. 7, 1988, Ser. No. 241,148
Term of patent 14 years
U.S. Cl. D21—69



309,480
COMBINED SPINNING TOY AND PACKAGE
Donald Olney, Rochester, N.Y., assignor to Brimms Inc., Tonawanda, N.Y.
Filed Feb. 1, 1988, Ser. No. 150,710
Term of patent 14 years
U.S. Cl. D21—92



309,481
CONSTRUCTION TOY ROOF BLOCK
Thomas E. Fish, Jr., Wickliffe, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Sep. 1, 1988, Ser. No. 240,556
Term of patent 14 years
U.S. Cl. D21—108



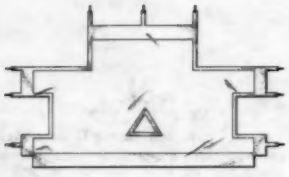
309,482
TOY HYPODERMIC SPRAYER
Richard M. Sternbach, 18408 Hatteras, No. 7,, Tarzana, Calif. 91356
Filed Sep. 23, 1987, Ser. No. 100,142
Term of patent 14 years
U.S. Cl. D21—109

309,483
DOLL
Theresa M. Leva, 582 Reynolds St., Whitby, Ontario, Canada (L1N 6H5)
Filed Jun. 18, 1987, Ser. No. 63,566
Claims priority, application Canada, Jan. 7, 1987, 07-01-87-3
Term of patent 14 years
U.S. Cl. D21—166

309,484
SKIPPING TOY
Avi Arad, Westport, Conn., and Melvin R. Kennedy, New York, N.Y., assignors to Tiger Electronics, Inc., Vernon Hills, Ill.
Filed Aug. 14, 1989, Ser. No. 393,471
Term of patent 14 years
U.S. Cl. D21—191

309,485
EXERCISE CYCLE
Curt G. Bingham, and William T. Dalebout, both of Logan, Utah, assignors to Weslo, Inc., Logan, Utah
Filed Dec. 21, 1988, Ser. No. 287,732
Term of patent 14 years
U.S. Cl. D21—194

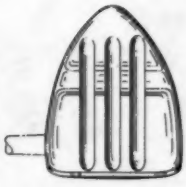
309,486
PRACTICE HOCKEY NET ATTACHMENT
Lauren D. Guenette, 7 Lynnview Court SE., Calgary, Alberta, Canada (T2C 3A4), and Gregg A. Nybo, Box 18, Site 12, S. S. 3, Calgary, Alberta, Canada (T3C 3N9)
Filed Apr. 28, 1987, Ser. No. 43,586
Claims priority, application Canada, Nov. 6, 1986, 06-11-86-4
Term of patent 14 years
U.S. Cl. D21—200



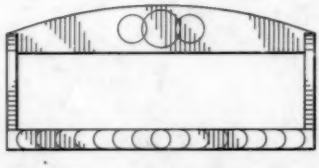
309,487
PORTABLE WATER FILTER
James L. Lieberman, 1720 S. Marshall Rd., #25, Boulder, Colo. 80302
Filed Nov. 4, 1988, Ser. No. 266,991
Term of patent 14 years
U.S. Cl. D23—209

309,488
GOLF CLUB HEAD
H. Edward Langert, 5145 Avenida Encinas, Suite B, Carlsbad, Calif. 92008
Filed Jul. 17, 1987, Ser. No. 74,515
Term of patent 14 years
U.S. Cl. D21—214

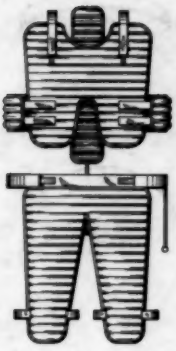
309,489
GOLF CLUB HEAD
Max W. Rome, 2597 Albany Ave., West Hartford, Conn. 06117, assignor to Robert Kay; Vi Hvasta and Max W. Rome, all of West Hartford, Conn.
Filed Nov. 16, 1987, Ser. No. 120,807
Term of patent 14 years
U.S. Cl. D21—217



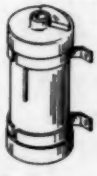
309,490
BALL RACK
Thomas O. Davis, and Karen J. Davis, both of 4613 S. Fuller, Independence, Mo. 64055
Filed Nov. 6, 1987, Ser. No. 117,655
Term of patent 14 years
U.S. Cl. D21—223



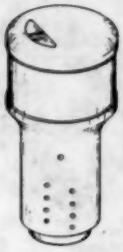
309,491
LIFE PRESERVER
Lawrence R. Martin, 1207 Ramsgate Rd., Flint, Mich. 48532
Filed Mar. 31, 1988, Ser. No. 176,406
Term of patent 14 years
U.S. Cl. D21—238



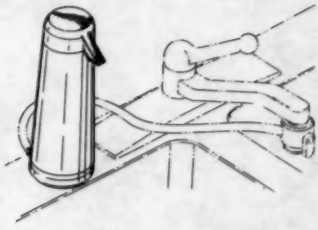
309,492
IN-LINE WATER FILTER
Ulrich K. Boehnke, Fort Myers, Fla., assignor to Diemold Machine Company, Inc., Fort Myers, Fla.
Filed Apr. 30, 1987, Ser. No. 44,137
Term of patent 14 years
U.S. Cl. D23—209



309,493
CHLORINE DISPENSER FOR SWIMMING POOLS
John M. Casberg, Cheshire, Conn., assignor to Olin Corporation, Cheshire, Conn.
Filed Sep. 16, 1988, Ser. No. 245,093
Term of patent 14 years
U.S. Cl. D23—208



309,494
WATER FILTER HOUSING
William S. Riley, Sulphur Springs, Tex., assignor to Silent Sentry, Inc., Tyler, Tex.
Filed Nov. 14, 1988, Ser. No. 271,072
Term of patent 14 years
U.S. Cl. D23—209

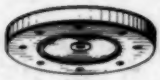


309,495
COMBINED HAND SHOWER AND SUPPORT
Roger H. Ramsey, Copley, and Mitchell L. Wilgus, Akron, both of Ohio, assignors to Stanadyne, Inc., Windsor, Conn.
Filed Jan. 13, 1987, Ser. No. 3,309
Term of patent 14 years
U.S. Cl. D23—223

309,496
COMBINED SHOWER HEAD AND ESCUTCHEON
Roger H. Ramsey, Copley, and Mitchell L. Wilgus, Akron, both of Ohio, assignors to Stanadyne, Inc., Windsor, Conn.
Filed Jan. 13, 1987, Ser. No. 3,302
Term of patent 14 years
U.S. Cl. D23—230

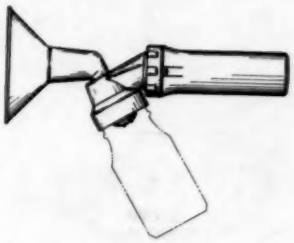
309,497
CABINET AIR-FRESHENER
Thom Kearnes, Akron, Ohio, assignor to The State Chemical Manufacturing Company, Cleveland, Ohio
Filed Aug. 26, 1988, Ser. No. 237,564
Term of patent 14 years
U.S. Cl. D23—366

309,498
CHROMATOGRAPHY COLUMN CLOSURE OR SIMILAR ARTICLE
Arthur E. Colvin, Jr., Mount Airy, Md., assignor to Cerex Corporation, Gaithersburg, Md.
Filed Aug. 20, 1987, Ser. No. 87,908
Term of patent 14 years
U.S. Cl. D24—8



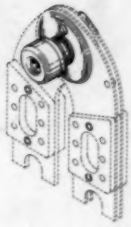
309,499
LIGAMENT GRAFT PASSER OR SIMILAR ARTICLE
Jerald A. Bowman, Warsaw, and Richard E. Hobbs, Huntington, both of Ind., assignors to DePuy, Division of Boehringer Mannheim, Indianapolis, Ind.
Filed Dec. 30, 1987, Ser. No. 139,365
Term of patent 14 years
U.S. Cl. D24—26

309,500
BREAST PUMP
Arthur H. Yuan, Hudson, Ohio, and Michael S. Joss, Chicago, Ill., assignors to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Filed Apr. 11, 1988, Ser. No. 180,857
Term of patent 14 years
U.S. Cl. D24—51

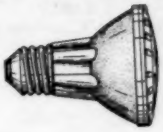


309,501
STICK PONY TOY
Patricia G. Wilson, 1217 Kittery Dr., Virginia Beach, Va. 23464
Filed Mar. 6, 1989, Ser. No. 318,940
Term of patent 14 years
U.S. Cl. D21—75

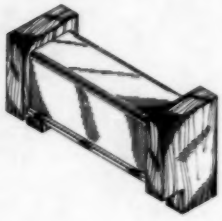
309,502
HINGE FOR LADDERS AND THE LIKE
Harold R. Wing, Springville, and Kenneth C. Cluff, Orem, both of Utah, assignors to Wing Enterprises, Inc., Springville, Utah
Filed Sep. 23, 1988, Ser. No. 248,471
Term of patent 14 years
U.S. Cl. D25—68



309,503
REFLECTOR-TYPE ELECTRIC LAMP OR THE LIKE
Timothy A. Benson, Winchester, and Peter R. Gagnon, Georgetown, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Division of Ser. No. 810,951, Dec. 19, 1985, Pat. No. Des. 301,069. This application Dec. 21, 1988, Ser. No. 287,756
The portion of the term of this patent subsequent to May 9, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—2



309,504
DECK LIGHT
Mark L. Hanson, Golden Valley, Minn., assignor to MinnFac, Inc., Golden Valley, Minn.
Filed Nov. 4, 1987, Ser. No. 116,542
Term of patent 14 years
U.S. Cl. D26—68

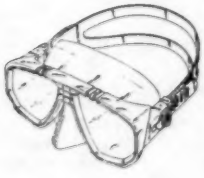


309,505
COMPRESSED POWDER TABLET
Steven F. Colton, Long Beach, N.Y., assignor to Vitarine Pharmaceuticals, Inc., Springfield Gardens, N.Y.
Filed Aug. 8, 1988, Ser. No. 229,275
Term of patent 14 years
U.S. Cl. D28—2

309,506
TABLET
Daniel Shurkus, Raleigh, N.C., assignor to Glaxo Inc., Research Triangle Park, N.C.
Filed Sep. 27, 1988, Ser. No. 250,132
Term of patent 14 years
U.S. Cl. D28—2

309,507
FREE STANDING TWEEZER
Grace C. Shafir, 36 Jane Dr., Englewood Cliffs, N.J. 07632
Filed Jul. 26, 1988, Ser. No. 224,132
Term of patent 14 years
U.S. Cl. D28—55

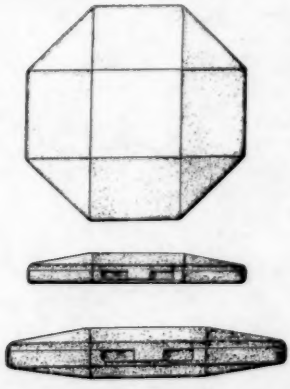
309,508
DIVING MASK
Taizo Sugita, Ichikawa, Japan, assignor to Kinugawa Pacific Co., Ltd., Tokyo, Japan
Filed Sep. 21, 1988, Ser. No. 247,308
Claims priority, application Japan, Aug. 16, 1988, 63-32607
Term of patent 14 years
U.S. Cl. D29—9



309,509
HELMET
William R. Mast, 18850 E. 114th St. S., Broken Arrow, Okla. 74011
Filed May 20, 1987, Ser. No. 51,820
Term of patent 14 years
U.S. Cl. D29—12

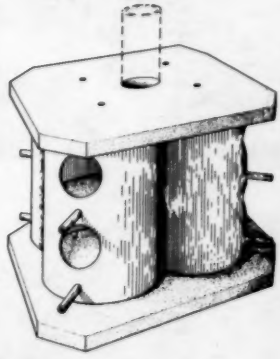
309,510
HAIR DRIER
Keiko Matoba, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 21, 1988, Ser. No. 184,151
Claims priority, application Japan, Oct. 30, 1987, 62-44585
Term of patent 14 years
U.S. Cl. D28—16

309,511
COSMETIC COMPACT
Bryan Bertlin, Leatherhead; Colin J. Enskat, Harrow-on-the-Hill, and Reginald W. Breese, Harrow, all of England, assignors to Toly Products (UK) Limited, Wembley, England
Filed Nov. 6, 1987, Ser. No. 118,348
Claims priority, application United Kingdom, May 11, 1987, 1042080
Term of patent 14 years
U.S. Cl. D28—78



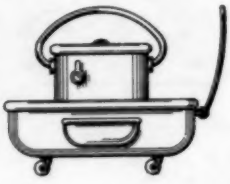
309,512
CHEEK FLAP FOR A HELMET
Robert W. Crow, Suite 3010, 105 Collier Rd., Atlanta, Ga. 30309
Continuation-in-part of Ser. No. 755,308, Jul. 15, 1985, abandoned. This application Jun. 25, 1987, Ser. No. 66,414
Term of patent 14 years
U.S. Cl. D29—16

309,513
BIRDHOUSE
Wallace E. Lockyer, Jr., P.O. Box 334, Engelhard, N.C. 27824
Filed Jun. 2, 1988, Ser. No. 201,126
Term of patent 14 years
U.S. Cl. D30—110

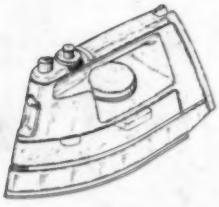


309,514
CAR SEAT FOR SMALL DOGS
Kathleen M. Marcus, and Steven A. Shubin, both of 29215 Laro Dr., Agoura, Calif. 91301
Filed Apr. 14, 1987, Ser. No. 38,347
Term of patent 14 years
U.S. Cl. D30—118

309,515
MOBILE STORAGE UNIT FOR CLOTHES AND LAUNDERING AIDS
Lenonda M. Robinson, 1931 Rodeo Rd. #1, Los Angeles, Calif. 90018
Filed Nov. 6, 1987, Ser. No. 117,658
Term of patent 14 years
U.S. Cl. D32—35

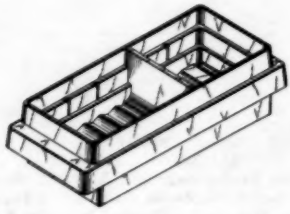


309,516
ELECTRIC IRON
Jan Klok, Hoogezand, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 24, 1988, Ser. No. 160,566
Claims priority, application United Kingdom, Sep. 2, 1987, 1044545; Sep. 2, 1987, 1044546
Term of patent 14 years
U.S. Cl. D32—70

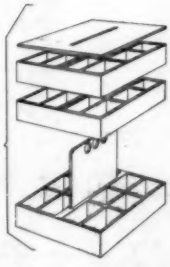


309,517
MOTORIZED CARRYING CART
Junior F. Hawkins, 3120 W. 16th, Wichita, Kans. 67203-1742
Filed Aug. 18, 1986, Ser. No. 897,099
Term of patent 14 years
U.S. Cl. D34—17

309,518
STORAGE BOX
Ake E. Vikland, Säffle, Sweden, assignor to Electrolux Constructor Aktiebolag, Saffle, Sweden
Filed Mar. 16, 1988, Ser. No. 168,738
Claims priority, application Sweden, Sep. 18, 1987, 87-2069
Term of patent 14 years
U.S. Cl. D34—40



309,519
STACKABLE MODULAR TRAYS
John P. Remler, 117 Duncan Rd., North Augusta, S.C. 29841
Filed Feb. 2, 1987, Ser. No. 10,155
Term of patent 14 years
U.S. Cl. D34—46



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TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF JULY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
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Kohonen, Raimo, 4,943,372, Cl. 210-324.000.

A. C. Nielsen Company: *See*—
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A. Testoni S.p.A.: *See*—
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A.W. Faber-Castell GmbH & Co.: *See*—
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Abe, Hideaki: *See*—
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Mohsen, Amr M.; Hamdy, Esmat Z.; and McCullum, John L., 4,943,538, Cl. 437-52.000.

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Rokicki, Andrzej, 4,943,677, Cl. 528-405.000.

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Ikeda, Yoshiyuki; and Ariki, Toshinori, 4,942,817, Cl. 102-331.000.

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Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 4,944,030, Cl. 354-403.000.
Takahashi, Nagashige; and Ouchi, Teruo, 4,942,867, Cl. 128-6.000.

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Iizuka, Takashi, 4,943,146, Cl. 350-471.000.
Morisawa, Tahei, 4,943,853, Cl. 358-102.000.
Usami, Junji, 4,942,866, Cl. 128-4.000.

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Abe, Hiroshi, 4,943,258, Cl. 453-30.000.

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Hoshino, Yukio; and Asai, Ko, 4,944,021, Cl. 382-5.000.

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Ashcraft, Jean D.: *See*—
Bailey, James R., Jr.; and Ashcraft, Jean D., 4,943,210, Cl. 417-12.000.

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Asten Group, Inc.: *See*—
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AT&T Bell Laboratories: *See*—
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Daudelin, Abraham N.; Hartnett, Ronald J.; and O'Connell, William A., 4,943,995, Cl. 379-67.000.
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Hwang, Frank K.; and Richards, Gaylord W., 4,944,029, Cl. 340-825.800.
Ling, Hung C., 4,943,557, Cl. 505-1.000.
Ren, Fan; and Shah, Nitin J., 4,943,540, Cl. 437-225.000.

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Imamiya, Keniti; Tanaka, Sumio; Miyamoto, Junichi; Atsumi, Shigeru; Ohtsuka, Nobuaki; and Saito, Shinji, 4,943,962, Cl. 365-230.080.

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Amberger, Franz; and Bois, Wilhelm, 4,942,937, Cl. 180-271.000.

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Austin, Jeffrey R., to NCR Corporation. Public key diversification method. 4,944,007, Cl. 380-21.000.

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Hughes, John L.; and Lastavec, Paul, 4,943,700, Cl. 219-121.670.

Automotive Moulding Company: *See*—
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Uekita, Masakazu; Awaji, Hiroshi; Murata, Makoto; and Mizunuma, Satoshi, 4,943,471, Cl. 428-220.000.

Awamura, Masaki; Yamamoto, Kazushi; and Nanjo, Masashi, to Sunstar Kabushiki Kaisha. Emulsified hair cosmetic. 4,943,431, Cl. 424-70.000.

Axle-Tru, Inc.: *See*—
Fournier, Jerald C., 4,942,667, Cl. 33-288.000.

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DeVries, Vern G.; Claus, Thomas H.; Floyd, Middleton B., Jr.; and Ayral-Kaloustian, Semiramis, 4,943,629, Cl. 536-117.000.

B. F. Goodrich Company, The: *See*—
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B-Line Systems, Inc.: *See*—
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Dellinger, Rick L., 4,942,673, Cl. 34-10.000.

Back, John T., to Oy Wiik & Hoglund AB. Large dimensional thermoplastic articles. 4,943,463, Cl. 428-44.000.

Bacon, Bruce L.: *See*—
Leavell, David R.; Spencer, Earl W., Jr.; and Bacon, Bruce L., 4,943,951, Cl. 367-111.000.

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Koch, Byron W.; and Badenhope, Robert I., 4,942,917, Cl. 164-369.000.

Bader, Scott K., to Motorola, Inc. Current switch for use in telephony systems or the like. 4,944,002, Cl. 379-388.000.

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Bailey, James R., Jr.; and Ashcraft, Jean D. Pump control system, level sensor switch and switch housing. 4,943,210, Cl. 417-12.000.

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Baker, John H.: *See*—
Markle, Richard A.; Brusky, Phyllis L.; and Baker, John H., 4,943,460, Cl. 428-36.900.

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Bakke, Paul D.: *See*—
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Balco International, Inc.: *See*—
Rumsey, Roger L., 4,942,710, Cl. 52-396.000.

Baldwin, Samuel L.; and Osteen, Mitchell M., to General Electric Company. Luminaire with auxiliary reflecting means. 4,943,901, Cl. 362-277.000.

Baltusis, Paul A.; Greene, Thomas L.; and Palansky, Bruce J., to Ford Motor Company. Automatic transmission electronic gearshift control having altitude corrected shift criteria. 4,943,921, Cl. 364-424.100.

Band, Elliot I.; and Eberhart, Suzanne T., to Akzo America Inc. Preparation of hexaalkyldisilthiane. 4,943,647, Cl. 556-426.000.

Bania, Paul J.; and Parris, Warren M., to Timet. High strength alpha-beta titanium-base alloy. 4,943,412, Cl. 420-420.000.

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Banks, Thomas M.: *See*—
Hatch, Frederick R.; Riley, William M.; and Banks, Thomas M., 4,943,068, Cl. 277-23.000.

Barbarini, Leonard. Mammography compression apparatus for prosthetically augmented breast. 4,943,986, Cl. 378-37.000.

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Bardai, Zaher; Rolph, Randy K.; Lamb, Arlene E.; Longo, Robert T.; Manoly, Arthur E.; and Forman, Ralph. Self-aligned gate process for fabricating field emitter arrays. 4,943,343, Cl. 156-643.000.

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Barker, Ronald C.; Schuler, Chester L.; Kiesel, Kenneth C.; and Moxon, Edwin C., to Lex Computer and Management Corporation. Video composition method and apparatus employing smooth scrolling. 4,943,866, Cl. 358-335.000.

Barr, John D.; and Wardley, Michael T., to Reed Tool Company, Ltd. Relating to rotary drill bits. 4,942,933, Cl. 175-329.000.

Barry Robertson: *See*—
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Bartkowiak, Frank: *See*—
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Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, 4,943,585, Cl. 514-398.000.
Dockner, Toni; Sauerwald, Manfred; Krug, Herbert; and Irgang, Matthias, 4,943,671, Cl. 585-642.000.
Dyksterhouse, Robert; Dyksterhouse, Joel A.; Handermann, Alan C.; and Western, Edward D., 4,943,472, Cl. 428-240.000.
Etzbach, Karl-Heinz; and Hisgen, Bernd, 4,943,617, Cl. 525-329.900.
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Schulz, Guenter; Schubert, Juergen; Sauter, Hubert; Grosmann, Klaus; and Jung, Johann, 4,943,315, Cl. 71-120.000.
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Bauer, Carsten: *See*—
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Bauer, Willi: *See*—
Flemming, Udo; and Bauer, Willi, 4,942,677, Cl. 36-27.000.

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Bausch & Lomb Incorporated: *See*—
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Boberg, Michael; Angerbauer, Rolf; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,943,568, Cl. 514-206.000.
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Immel, Otto; Schwarz, Hans-Helmut; and Thiel, Reinhard, 4,943,549, Cl. 502-304.000.
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Guzman-Edery, Jorge; Steiger, Wolfgang; and Boer, Michael, 4,943,926, Cl. 364-486.000.

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Beasley, Craig J.; Lynn, Walter S.; and Chambers, Ronald E., to Western Atlas International, Inc. Method for migrating seismic data. 4,943,950, Cl. 367-50.000.

Beaucoup, Louis; Boncompain, Jean; and Reynaud, Jean-Claude, to Schlumberger Technologies, Inc. Manipulator apparatus. 4,943,020, Cl. 248-124.000.

Becker, Robert D.: *See*—
Giunta, Richard F.; Becker, Robert D.; Schwartz, Martin J.; Coyle, Richard W.; and Curcuru, Kevin H., 4,943,966, Cl. 371-11.100.

Becker, Samuel R. Dam support bracket for masonry construction. 4,943,023, Cl. 248-302.000.

Beckham, Jeffrey C.: *See*—
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Beecham Group p.l.c.: *See*—
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Beehler, Richard F., to Heil-Quaker Corporation. Hub for a plastic blower impeller. 4,943,209, Cl. 416-204.00R.

Beers, Howard L., to HF Scientific, Inc. Viscosity testing apparatus. 4,942,759, Cl. 73-56.000.

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Casalbore-Miceli, Giuseppe; Beggiato, Giancarlo; DiMarco, Pier G.; and Giro, Gabriele, 4,943,499, Cl. 429-192.000.

Bell, Allyn R., to Uniroyal Chemical Company, Inc. Method of defoleating cotton plants employing 3-carbonylphenyl uracil derivatives. 4,943,309, Cl. 71-74.000.

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Deri, Robert J.; and Kapon, Elyahou, 4,943,133, Cl. 350-96.140.

Bell, James P.; and Yu, Yunzhao, to University of Connecticut, The. Polycarbonate-epoxy polymer. 4,943,619, Cl. 525-463.000.

Bellinson, Susan. Method and apparatus for monitoring descent of fetus. 4,942,882, Cl. 128-775.000.

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Wedel, Gregory L., 4,943,351, Cl. 162-205.000.

Beltramini, Angelo, to Montedison S.p.A. Differentiating logical circuit for asynchronous systems. 4,943,744, Cl. 307-480.000.

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Benedetti, Giampietro; and Di Giusto, Bruno, to Danieli & C. Officine Meccaniche SpA. Plant and method for the temperature-equalization of slabs downstream of a continuous casting plant. 4,942,656, Cl. 29-527.600.

Benetti, Cristiano, to Lange International S.A. Ski boot. 4,942,680, Cl. 36-119.000.

Benjamin Obdyke Incorporated: *See*—
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Benn, Raymond C.; Smith, Gaylord D.; and Boone, Donald H., to INCO Alloys International, Inc. Corrosion resistant coating for oxide dispersion strengthened alloys. 4,943,487, Cl. 418-552.000.

Benoit, Louis; and Nerrinck, Bernard, to Salomon, S.A. Foot retention apparatus for a ski boot. 4,942,681, Cl. 36-119.000.

Benshaw, Inc.: *See*—
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Benson, Clark K.; Caridis, Andrew A.; and Klein, Lawrence F., to Heat and Control, Inc. Food processing apparatus. 4,942,808, Cl. 99-404.000.

Benson, Florence G.: *See*—
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Benz, Paul; and Lippold, Gunther, to Alcatel N.V. Controllable AC voltage amplifier. 4,943,785, Cl. 330-277.000.

Berberich, Joseph P.: *See*—
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Terrell, David R.; Monbaliu, Marcel J.; Grigo, Ulrich; and Berg, Klaus, 4,943,502, Cl. 430-58.000.

Berg, Sven-Olof; and Broden, Ingemar, to Pronova AB. Package band. 4,943,168, Cl. 383-38.000.

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Bergman, Charles H., Jr.: *See*—
Nelson, James S.; Angell, Scott L.; Mannerud, Jack E.; and Bergman, Charles H., Jr., 4,943,447, Cl. 427-55.000.

Bergquist, Dan, to Swedal-Systems HB. Outer walls or roofs. 4,942,711, Cl. 52-397.000.

Bernd, Hubert; Heiby, Pierre; and Sitter, Alfred, to Mannesman Rexroth GmbH. Means for feeding fluid into a pressure conduit. 4,943,212, Cl. 417-7.000.

Berney, Joseph C. Bottom case loader and method. 4,942,720, Cl. 53-447.000.

Bernhardt, Bruno. Aerating apparatus for expelling volatile impurities from ground water. 4,943,305, Cl. 55-170.000.

Bernschein, Ursula: *See*—
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Berry, Ronald F.: *See*—
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Berthoud, Bernard: *See*—
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Detre, Tamas; Angyan, Sandor; Pap, Laszlo; Szego, Andras; Karadi, Zoltan; Bertus nee Bende, Klara; and Marmarosi nee Kellner, Katalin, 4,943,307, Cl. 71-3.000.

Bessette, David M. Protective liner for containers. 4,942,978, Cl. 220-470.000.

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Beyhl, Friedrich E.: *See*—
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BGK Finishing Systems, Inc.: *See*—
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Bice, Archie R.: *See*—
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Biener, Hans F. Salt-mixture for the treatment of psoriasis. 4,943,432, Cl. 424-647.000.

Big Time Toy Co., The: *See*—
Klundt, Kalvin K., 4,943,255, Cl. 446-15.000.

Bigelow, Louis K.: *See*—
Sung, Chien-Min; Chen, Sy-Hwa; Merrill, Leo; and Bigelow, Louis K., 4,943,488, Cl. 428-552.000.

Billings, William W.: *See*—
Fox, David A.; and Billings, William W., 4,943,761, Cl. 323-283.000.

Billon, Jean, to Compagnie Plastic Omnium, S.A. Mechanism for handling garbage pails. 4,943,201, Cl. 414-408.000.

Biogen, Inc.: *See*—
Gilbert, Walter; Fisher, Richard A.; Sato, Vicki L.; and Leban, Johann J., 4,943,627, Cl. 530-324.000.

BioResearch, Inc.: *See*—
Kurtz, Leonard D.; and LiCausi, Joseph, 4,943,288, Cl. 604-408.000.

BioVentures, Inc.: *See*—
Dawson, Elliott, 4,943,525, Cl. 435-7.000.

Birkenfeld, Willi: *See*—
Schilo, Diederich; and Birkenfeld, Willi, 4,943,484, Cl. 428-373.000.

Bitko, Sheldon S., to Fifth Dimension, Inc. Position insensitive shock sensor with closure delay. 4,943,690, Cl. 200-61.470.

Black & Decker Inc.: *See*—
Gerke, Burton E., Jr.; and Kosten, Richard B., 4,942,641, Cl. 15-338.000.

Black & Veatch, Engineers-Architects: *See*—
Levy, Sheldon L., 4,943,325, Cl. 136-259.000.

Blackburn, Gary R.; Mackerer, Carl R.; and Schreiner, Ceinwen A., to Mobil Oil Corporation. Method for evaluating mutagenicity. 4,943,521, Cl. 435-6.000.

Blair, Richard: *See*—
Davis, Anton; Simmons, Kelvin A.; and Blair, Richard, 4,942,885, Cl. 128-842.000.

Blaseck, Klaus: *See*—
Radovan, Giuseppe; Blaseck, Klaus; Hoffmeister, Lothar; Westendorf, Helmut; Sandling, Michael J.; and Davidson, James W., 4,942,897, Cl. 137-454.200.

Blem, Allen R.: *See*—
Lai, Hoi K.; Davis, Robert A.; and Blem, Allen R., 4,943,311, Cl. 71-90.000.

Blewitt, William D.: *See*—
Young, John S.; Kruis, Peter; and Blewitt, William D., 4,943,958, Cl. 370-77.000.

Bloch, Linda R., legal representative: *See*—
Lang, Anthony; and Bloch, Paul, deceased, 4,943,126, Cl. 350-3.690.

Bloch, Paul, deceased: *See*—
Lang, Anthony; and Bloch, Paul, deceased, 4,943,126, Cl. 350-3.690.

Bloom Engineering Company, Inc.: *See*—
Finke, Harry P., 4,942,832, Cl. 110-190.000.

Board of Trustees operating Michigan State University: *See*—
Asmussen, Jes; and Reinhard, Donnie K., 4,943,345, Cl. 156-643.000.

Boberg, Michael; Angerbauer, Rolf; Metzger, Karl G.; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. Cephalosporins. 4,943,568, Cl. 514-206.000.

Bobry, Howard H., to Albar, Inc. Ferroresonant transformer with dual outputs. 4,943,763, Cl. 323-309.000.

BOC Group, Inc., The: *See*—
Ramachandran, Ramakrishnan; Andrecovich, Mark J.; MacLean, Donald L.; and Satchell, Donald P., Jr., 4,943,650, Cl. 558-319.000.

Bocchi, Luigi. Method for production of containers in thermoplastic material, in particular sheets of polyethylene-terephthalate. 4,943,406, Cl. 264-522.000.

Bodson, Guy: *See*—
Gobert, Jean; Geerts, Jean-Pierre; and Bodson, Guy, 4,943,639, Cl. 548-550.000.

Boegesoe, Klaus P.; and Perregaard, Jens, to H. Lundbeck A/S. Pharmaceutically useful (+)-1-(3-dimethylaminopropyl)-1-(4'-fluorophenyl)-1,3-dihydrosobenzofuran-5-carbonitrile and non-toxic acid addition salts thereof. 4,943,590, Cl. 514-469.000.

Boegh, Alan D. V. Sand filter cleaning system. 4,943,211, Cl. 417-131.000.

Boehlke, Klaus: *See*—
Taubitz, Christof; Gausepohl, Hermann; Seiler, Erhard; Boehlke, Klaus; and Schlemmer, Lothar, 4,943,399, Cl. 264-101.000.

Boehringer Mannheim GmbH: *See*—
Rauscher, Elli; Griffiths, John; and Dixon, Leonard F., 4,943,526, Cl. 435-15.000.

Boeing Company, The: *See*—
Aslin, Matthew J.; and Patton, Gary J., 4,943,919, Cl. 364-424.030.
Hales, John C.; and Nelson, Everett J., 4,943,865, Cl. 358-335.000.
Popoff, Alexander A., 4,943,136, Cl. 350-96.160.

Boenigk, Winfried; Zander, Maximilian; and Stadelhofer, Jurgen, to Rutgerswerke AG. Method for the production of modified pitches and the further application. 4,943,365, Cl. 208-44.000.

Boer, Michael: *See*—
Guzman-Edery, Jorge; Steiger, Wolfgang; and Boer, Michael, 4,943,926, Cl. 364-486.000.

Boeshart, Patrick E. Scaffold jack. 4,942,940, Cl. 182-82.000.

Bogart, Larry; Hipkins, James J.; and Edelson, Nathan A., to Scott Paper Company. Chemically treated paper products - towel and tissue. 4,943,350, Cl. 162-158.000.

Bogdan, Wolfgang: *See*—
Patzschke, Hans-Peter; Luttenberg, Albrecht; Schlimog, Hans-Jurgen; and Bogdan, Wolfgang, 4,943,359, Cl. 204-181.600.

Boggan, Elvis W., to Visa International Service Association. Transaction approval system. 4,943,707, Cl. 235-380.000.

Boggs, Bruce E., to United States Pollution Control Company, Inc. Sludge stabilizing method and apparatus. 4,943,165, Cl. 366-348.000.

Bohata, John. Retriever truck. 4,943,203, Cl. 414-486.000.

Bois, Wilhelm: *See*—
Amberger, Franz; and Bois, Wilhelm, 4,942,937, Cl. 180-271.000.

Bolden, Paul L., Jr.: *See*—
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; Deal, James F., III; and Bolden, Paul L., Jr., 4,943,390, Cl. 252-355.000.

Bolling, Steven F. Retrograde coronary sinus cardioplegia cannula and method for using same in heart surgery. 4,943,277, Cl. 604-96.000.

Bolt Beranek and Newman Inc.: *See*—
Harriman, Edward S., Jr., 4,943,941, Cl. 364-748.000.

Boncompain, Jean: *See*—
Beaucoup, Louis; Boncompain, Jean; and Reynaud, Jean-Claude, 4,943,020, Cl. 248-124.000.

Bonifer, Edgar; Duttine, Walter; Jahns, Werner; and Kratz, Helmut, to Mannesmann Aktiengesellschaft. Conveying roller apparatus. 4,942,957, Cl. 198-781.000.

Bonne, Ulrich: *See*—
Aagardl, Roger L.; Bonne, Ulrich; and Matthys, Robert J., 4,944,035, Cl. 364-556.000.

Boone, Donald H.: *See*—
Benn, Raymond C.; Smith, Gaylord D.; and Boone, Donald H., 4,943,487, Cl. 418-552.000.

Borg-Warner Corporation: *See*—
Mott, Philip J., 4,943,266, Cl. 474-201.000.

Born, Eberhard: *See*—
Kacza, Martin; Rest, Hartmut; and Born, Eberhard, 4,942,904, Cl. 138-89.000.

Borodulin, German; Shkornik, Alexander; Persidsky, Maxim D.; and Narayan, Perinchery, to Urological Instruments Research, Inc. Expandable urethral bougie. 4,942,869, Cl. 128-43.000.

Bose, Ajit K., to Smit Transformation B.V. Frequency-dependent overvoltage protective device for high voltage appliances. 4,943,887, Cl. 361-56.000.

Bose, Amar G.; and Veranth, Joseph L., to Bose Corporation. Speed controlled amplifying. 4,944,018, Cl. 381-86.000.

Bose Corporation: *See*—
Bose, Amar G.; and Veranth, Joseph L., 4,944,018, Cl. 381-86.000.

Boskamp, Eddy B.; and Mens, Wilhelmus R. M., to U.S. Philips Corporation. Magnetic resonance apparatus with uncoupled rf coils. 4,943,775, Cl. 324-322.000.

Boucher, Heather A.: *See*—
Hamner, Glen P., deceased; Boucher, Heather A.; and Wachter, William A., 4,943,672, Cl. 585-737.000.

Bou dour, Abdu: *See*—
Johnson, Carl E. A.; Ormsby, Jay L.; Chase, Eric T.; Quackenbos, George S.; Broude, Sergey V.; and Bou dour, Abdu, 4,943,734, Cl. 250-572.000.

Bouillet, Edmond; Colery, Jean-Claude; Declerck, Claude; and Ledoux, Pierre, to Interox (Societe Anonyme). Process for the manufacture of explosive cartridges, and explosive cartridges obtained using the said process. 4,942,800, Cl. 86-20.100.

Bourdonne, Jean-Claude; and Briand, Alain, to Framatome. Device for locating the ideal screwing position of bolts of large dimensions. 4,942,660, Cl. 29-701.000.

Bouton, Marie-Madeleine: *See*—
Nedelec, Lucien; Nique, Francois; Philibert, Daniel; Moguilewsky, Martine; and Bouton, Marie-Madeleine, 4,943,566, Cl. 514-179.000.

Bowditch, Hoel L., to Deere & Company. Mechanism and method for converting a fixed wheel walk-behind mower to a caster wheel walk-behind mower and vice versa. 4,942,726, Cl. 56-17.200.

Bowe, Michael J.; and Clark, Stuart A., to United Kingdom Atomic Energy Authority. Spray generators. 4,943,007, Cl. 239-405.000.

Bowers, Kevin R. Ping pong table accessory apparatus. 4,943,056, Cl. 273-30.000.

Bowers, William S.; and Sugiyama, Takeyoshi, to Arizona Board of Regents for the University of Arizona. Pyrazole-containing juvenile hormone mimics for pest control, compositions and use. 4,943,586, Cl. 514-406.000.

Bowie, Stuart S. Container for releasing fabric conditioners in washing machines. 4,942,973, Cl. 220-201.000.

Boyer, Kirk A.; and Yonezawa, Shigeki, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kagyo Kabushiki Kaisha. Inflatable watercraft with portable engine package. 4,942,838, Cl. 114-345.000.

Boymel, Paul: *See*—
Bailey, Douglas J.; Boymel, Paul; and Cerdan, Juan M., 4,943,465, Cl. 428-102.000.

Boze, Ronald A.; and Warning, Theodore A. Apparatus and process for filtering fluids. 4,943,379, Cl. 210-778.000.

Bozek, John W. Cross bow with improved cocking mechanism. 4,942,861, Cl. 124-25.000.

Bracewell, Ross W. Auger drilling system. 4,942,932, Cl. 175-323.000.

Bradbury, John R. Apparatus for storing and dispensing particulate ice. 4,942,983, Cl. 222-238.000.

Bradbury, Philip: *See*—
Hellwig, John; and Bradbury, Philip, 4,942,805, Cl. 98-1.000.

Bradfield, Dean L.: *See*—
McGuckin, James P.; Bradfield, Dean L.; Foltz, Raymond A.; and Heidt, H. James, 4,943,185, Cl. 405-45.000.

Bradley, Eric M., to General Dynamics Corporation, Electronics Division. Surface emitting laser. 4,943,970, Cl. 372-45.000.

Bradley, Ralph E. Wedging tree stand. 4,942,942, Cl. 182-187.000.

Bradshaw, Jerald S.; Izatt, Reed M.; Bruening, Ronald L.; and Christensen, James J., deceased (by Christensen, Virginia, successor in title), to Brigham Young University. The process of separating a selected ion from a plurality of other ions in a multiple ion solution by contacting the solution with a macrocyclic ligand boneded to silica which selectively complexes with the desired ion. 4,943,375, Cl. 210-674.000.

Braem, Daniel: *See*—
Abdelgawad, Ahmed; Braem, Daniel; and Nyffeler, Urs, 4,942,887, Cl. 131-336.000.

Braemert, Peter: *See*—
Britzke, Ingo; and Braemert, Peter, 4,942,825, Cl. 105-18.000.

Brammer, Hartmut: *See*—
Jaki, Friedrich; and Brammer, Hartmut, 4,942,856, Cl. 123-146.50A.

Brandenburg, Darrell L., to General Motors Corporation. Retractable headlamp assembly. 4,943,895, Cl. 362-66.000.

Brandon, Michael D.; Dorris, Robert A.; Garrett, Robert T.; Helton, Roy N.; Roney, Don G.; and Vinson, James R., to Genesco, Inc. Styled comfort shoe construction. 4,942,679, Cl. 36-102.000.

Brandt, Harold. Adhesive template tape. 4,942,670, Cl. 33-494.000.

Breneman, Bruce C.; Parker, J. Wesley; and Sarwinski, Raymond E., to General Atomics. Magnetic field control apparatus. 4,943,774, Cl. 324-318.000.

Brenker, Gunter: *See*—
Wagner, Wolf-Dietrich; Klumpp, Rolf; Strobel, Wolfgang; and Brenker, Gunter, 4,942,858, Cl. 123-193.00H.

Brent, Michael, to Anamartic Limited. Control system for chained circuit modules. 4,943,946, Cl. 365-189.120.

Breton, Bernard C.; Thong, John T. L.; and Nixon, William C., to Trialsite Limited. Charged particle beam scanning apparatus. 4,943,722, Cl. 250-310.000.

Briand, Alain: *See*—
Bourdonne, Jean-Claude; and Briand, Alain, 4,942,660, Cl. 29-701.000.

Bridgestone Corporation: *See*—
Kawabata, Misao, 4,943,331, Cl. 156-129.000.
Sakaguchi, Akihiro; Kaneko, Noriyuki; Saruta, Toshio; and Sawano, Ryotaro, 4,943,332, Cl. 156-146.000.

Brigham Young University: *See*—
Bradshaw, Jerald S.; Izatt, Reed M.; Bruening, Ronald L.; and Christensen, James J., deceased, 4,943,375, Cl. 210-674.000.

Bristol-Myers Squibb Company: *See*—
Meanwell, Nicholas A., 4,943,573, Cl. 514-253.000.
Tencza, Thomas M.; and Kim, Chung-Bin, 4,943,565, Cl. 514-161.000.

Brita, Guido P.: *See*—
Lewis, Thomas W.; Hamill, Paul E., Jr.; Ozgu, Mustafa R.; Padfield, Ralph C.; Rego, Donovan N.; and Brita, Guido P., 4,942,986, Cl. 222-590.000.

British Nuclear Fuels PLC: *See*—
Rushton, Alan, 4,943,318, Cl. 423-10.000.

British Petroleum Co. p.l.c.: *See*—
Hopper, Hans P., 4,943,187, Cl. 405-190.000.

British Steel plc: *See*—
Jenkins, David P.; and Edmundson, James T., 4,943,231, Cl. 431-215.000.

British Telecommunications Public Limited Company: *See*—
Gouvianakis, Nikolaos; and Xydeas, Costas, 4,944,013, Cl. 381-38.000.
Nelson, Brian P., 4,943,134, Cl. 350-96.130.

Britzke, Ingo; and Braemert, Peter. Connect platform for rail vehicles. 4,942,825, Cl. 105-18.000.

Broadley, Donald, to National Nuclear Corporation Limited. Reactivity control in nuclear reactors. 4,943,409, Cl. 376-212.000.

Broden, Ingemar: *See*—
Berg, Sven-Olof; and Broden, Ingemar, 4,943,168, Cl. 383-38.000.

Brodersen, Cole T.; and Foster, Danny S., to Sears Manufacturing Company. Suspension device with cam support member. 4,943,037, Cl. 267-131.000.

Bromine Compounds Limited: *See*—
Itzhak, David, 4,943,480, Cl. 428-332.000.

Bronicki, Lucien Y., to Ormat Inc. Method of and apparatus for producing power from solar energy. 4,942,736, Cl. 60-641.120.

Brooklyn Union Gas Company, The: *See*—
Markbreiter, Stephen J.; Dessanti, Daniel J.; and Schorr, Hans P., 4,942,734, Cl. 60-39.020.

Brosnan, Michael: *See*—
Byrne, John V.; McMullin, Francis; Devitt, Francis; O'Dwyer, Jeremiah; Murphy, John; Egan, Michael; Brosnan, Michael; and Lawton, James, 4,943,760, Cl. 318-701.000.

Brostrom, Pekka: *See*—
Koskinen, Matti; and Brostrom, Pekka, 4,943,193, Cl. 410-69.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Oguri, Takashi, 4,942,835, Cl. 112-302.000.
Sakai, Jun; Higashiyama, Shunichi; Suzuki, Koji; and Ohta, Mitsuru, 4,943,509, Cl. 430-138.000.
Taki, Kazunari, 4,943,131, Cl. 350-96.120.

Broude, Sergey V.: *See*—
Johnson, Carl E. A.; Ormsby, Jay L.; Chase, Eric T.; Quackenbos, George S.; Broude, Sergey V.; and Bou dour, Abdu, 4,943,734, Cl. 250-572.000.

Brown, Charles R. T.: *See*—
Norton, Ian T.; and Brown, Charles R. T., 4,943,445, Cl. 426-573.000.

Brown, David E.; and Leichter, Louis M., to Minnesota Mining and Manufacturing Company. Dyes suitable for sensitization of photoconductive systems. 4,943,638, Cl. 548-455.000.

Brown, Dearg S.: *See*—
Naylor, Alan; Judd, Duncan B.; and Brown, Dearg S., 4,943,578, Cl. 514-252.000.

Brown, Glen A. Apparatus for handling source capsule assemblies. 4,943,731, Cl. 250-497.100.

Brown, Scott H.: *See*—
Kolts, John H.; Brown, Scott H.; and Tooley, Patricia A., 4,943,550, Cl. 502-327.000.

Brown, Shawn W. Body weight distribution support chair. 4,943,117, Cl. 297-392.000.

Browning, Edward A., Jr.: *See*—
Campbell, W. Carroll; Evans, Michael W.; Browning, Edward A., Jr.; and Stone, Robert J., 4,943,762, Cl. 323-284.000.

Brueckmann, Ralf; Leitner, Heinz; and Schoepke, Holger, to BASF Aktiengesellschaft. Preparation of aqueous polyester dispersions and use thereof. 4,943,602, Cl. 524-600.000.

Bruening, Ronald L.: *See*—
Bradshaw, Jerald S.; Izatt, Reed M.; Bruening, Ronald L.; and Christensen, James J., deceased, 4,943,375, Cl. 210-674.000.

Brun, Robert: *See*—
Baziard, Yves; Brun, Robert; and Duprat, Annette P., 4,943,453, Cl. 427-309.000.

Bruski, Richard S.; Hudson, Larry G.; and Skibo, Michael D., to Dural Aluminum Composites Corp. Cast composite material having a matrix containing a stable oxide-forming element. 4,943,490, Cl. 428-614.000.

Brusky, Phyllis L.: *See*—
Markle, Richard A.; Brusky, Phyllis L.; and Baker, John H., 4,943,460, Cl. 428-36.900.

Bryan, Thomas T., to Minnesota Mining and Manufacturing Company. Thermoset-thermoplastic molded article for dental restoration. 4,943,237, Cl. 433-213.000.

Bryne, Richard M. Clipless bicycle pedal system. 4,942,778, Cl. 74-594.600.

BTR Industrial Holdings, Ltd.: *See*—
Herbet, Abel, 4,942,911, Cl. 141-359.000.

Buchon, Michel: *See*—
Rabian, Jean; Potet, Jean-Claude; and Buchon, Michel, 4,943,955, Cl. 368-156.000.

Buckholz, Lawrence L., Jr.; Byrne, Brian; and Sudol, Marion A., to International Flavors & Fragrances Inc. Microwave apparatus for baking and browning foodstuff. 4,943,697, Cl. 219-10.55B.

Buecheler, Herbert, to Henkel Kommanditgesellschaft auf Aktien. Hollow plastic body having a glossy surface. 4,943,458, Cl. 428-35.700.

Buehler Ltd.: *See*—
Linke, Thomas A.; Wilkerson, Alan W.; and Parida, Ashok K., 4,942,795, Cl. 83-72.000.

Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, to BASF Aktiengesellschaft. N-substituted azoles and insecticide, arachnicide, and nematocide compositions thereof. 4,943,585, Cl. 514-398.000.

Buffum, Charles M.: *See*—
Baker, William T., Jr.; Buffum, Charles M.; Jolissaint, Charles H.; and Kerlin, Gregg W., 4,943,996, Cl. 379-96.000.

Bundy, Wayne M.; Manasso, John A.; and Berberich, Joseph P., to Georgia Kaolin Company, Inc. High performance paper filler and method of producing same. 4,943,324, Cl. 106-486.000.

Burchett, Donald K.: *See*—
Kafka, Fred Y.; Bice, Archie R.; and Burchett, Donald K., 4,943,402, Cl. 264-141.000.

Burndy Corporation: *See*—
Pecora, Gennaro L., 4,942,757, Cl. 72-453.160.

Burow, Kenneth W., Jr., to Eli Lilly and Company. N-heterocyclic benzamides. 4,943,634, Cl. 544-224.000.

Burrell, Gordon: *See*—
Evans, John M.; Stemp, Geoffrey; Burrell, Gordon; and Cassidy, Frederick, 4,943,582, Cl. 514-320.000.

Burruel, Sergio G. Ice making apparatus. 4,942,742, Cl. 62-347.000.

Buzzelli, Robert. E clip fastener installing tool. 4,942,655, Cl. 29-229.000.

Byrne, Brian: *See*—
Buckholz, Lawrence L., Jr.; Byrne, Brian; and Sudol, Marion A., 4,943,697, Cl. 219-10.55B.

Byrne, John V.; McMullin, Francis; Devitt, Francis; O'Dwyer, Jeremiah; Murphy, John; Egan, Michael; Brosnan, Michael; and Lawton, James, to Kollmorgen Corporation. Control systems for variable reluctance electrical machines. 4,943,760, Cl. 318-701.000.

C. R. Bard, Inc.: *See*—
Samiotes, Nicholas G.; and Lucas, Paul, 4,943,279, Cl. 604-151.000.

Cable/Home Communication Corp.: *See*—
Katznelson, Ron D., 4,943,847, Cl. 358-12.000.

Caccavo, Joseph F. Pediatric X-ray post. 4,943,992, Cl. 378-208.000.

Calgene, Inc.: *See*—
Houck, Catherine M.; and Pear, Julie R., 4,943,674, Cl. 800-205.000.

California Biotechnology Inc.: *See*—
Protter, Andrew A.; Vigne, Jean-Louis; Mallory, Joanne B.; Talmadge, Karen D.; and Kane, John P., 4,943,527, Cl. 435-69.600.

Callahan, Michael J., Jr.: *See*—
Early, Adrian B.; Harris, Larry L.; and Callahan, Michael J., Jr., 4,943,807, Cl. 341-120.000.

Campbell, Albert E.; Hug, William F.; and Reid, Ray D. Elongated carrier with a plurality of spot-sources of heat for use with stereolithographic system. 4,943,928, Cl. 364-477.000.

Campbell, Ian B.: *See*—
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; and Campbell, Ian B., 4,943,591, Cl. 514-539.000.

Campbell, Jack J.: *See*—
Faroudja, Yves C.; and Campbell, Jack J., 4,943,849, Cl. 358-12.000.

Campbell, W. Carroll; Evans, Michael W.; Browning, Edward A., Jr.; and Stone, Robert J., to Codar Technology, Inc. Power supply system. 4,943,762, Cl. 323-284.000.

Canadian Patents and Development Limited: *See*—
Alden, Adrian W.; Jull, George W.; and Ohno, Tom T., 4,943,811, Cl. 343-814.000.

Canon Equipment Company: *See*—
Finstad, Clem B.; and Fredrickson, Howard J., 4,943,040, Cl. 269-69.000.

Cannon, Thomas G.; Roemmich, Bruce D.; and Precht, Terry A., to Colorado Memory Systems, Inc. Fine head positioning system for a tape backup device. 4,943,877, Cl. 360-106.000.

Canon Kabushiki Kaisha: *See*—
Kumagai, Motoo; Kato, Keiichi; Nagano, Masato; and Sakaguchi, Michiaki, 4,943,469, Cl. 428-209.000.
Miyata, Seizo, 4,943,145, Cl. 350-354.000.
Sugishima, Kiyohisa, 4,943,870, Cl. 358-451.000.
Toma, Hitoshi; Hisamura, Masafumi; and Tanaka, Shigemori, 4,943,819, Cl. 346-160.100.

Capron, Mark E.; and Jenkins, James F., to United States of America, Navy. Container connector having a skewed installation configuration. 4,942,975, Cl. 220-23.400.

Carbonetti, Italo. Tennis racket with fixed grip and movable frame. 4,943,058, Cl. 273-73.00J.

Carborundum Company, The: *See*—
Bailey, Douglas J.; Boymel, Paul; and Cerdan, Juan M., 4,943,465, Cl. 428-102.000.

Cardon, Walter E.: *See*—
Vanmarcke, Luc A.; and Cardon, Walter E., 4,943,308, Cl. 71-29.000.

Cardwell, Gilbert I., Jr. Power supply in which regulation is achieved by processing a small portion of applied power through a switching regulator. 4,943,903, Cl. 363-97.000.

Carew, Edward C.: *See*—
Morley, Robert S.; and Carew, Edward C., 4,944,004, Cl. 379-412.000.

Caridis, Andrew A.: *See*—
Benson, Clark K.; Caridis, Andrew A.; and Klein, Lawrence F., 4,942,808, Cl. 99-404.000.

Carl Schenck AG: *See*—
Walz, Reinhold; Hildebrandt, Klaus; and Willgerodt, Udo, 4,942,828, Cl. 108-55.500.

Carl-Zeiss-Stiftung: *See*—
Enderle, Eckhard; Aehnelt, Hans-Peter; and Kaufmann, Dieter, 4,942,671, Cl. 33-559.000.

Carlton, Phillip: *See*—
Wickmann, John T.; and Carlton, Phillip, 4,942,666, Cl. 33-203.180.

Carman, Richard A.: *See*—
Wimberger, Richard J.; Wickesberg, Donald L.; and Carman, Richard A., 4,942,676, Cl. 34-51.000.

Carmen, Raleigh A., to Miles Inc. Red blood cell storage system. 4,943,287, Cl. 604-408.000.

Caroff, Pierre: *See*—
Maupu, Jean-Louis; Chollet, Hugues; Caroff, Pierre; and Duhot, Denis, 4,943,772, Cl. 324-207.200.

Carr, Richard V. C.; and Johnson, Thomas A., to Air Products and Chemicals, Inc. Catalytic preparation of cyanoalkyl lactams. 4,943,633, Cl. 540-531.000.

Carroll Touch Inc.: *See*—
Masters, Timothy E.; Lucas, Paul B.; Garrett, James E.; and Carstedt, John K., 4,943,806, Cl. 341-31.000.

Carstedt, John K.: *See*—
Masters, Timothy E.; Lucas, Paul B.; Garrett, James E.; and Carstedt, John K., 4,943,806, Cl. 341-31.000.

Carter, Thomas P.: *See*—
Lipson, Melvin A.; Carter, Thomas P.; Shelnut, James G.; and Roos, Leo, 4,943,513, Cl. 430-260.000.

Carver, Thomas E.: *See*—
Akamine, Shinya; Albrecht, Thomas R.; and Carver, Thomas E., 4,943,719, Cl. 250-306.000.

Casalbore-Miceli, Giuseppe; Beggiato, Giancarlo; DiMarco, Pier G.; and Giro, Gabriele, to Consiglio Nazionale Delle Ricerche. Conductor polymers usable in the construction of completely dry batteries. 4,943,499, Cl. 429-192.000.

Casio Computer Co., Ltd.: *See*—
Suetaka, Hiroyuki; and Kurahashi, Shigeki, 4,943,867, Cl. 358-342.000.

Cassar, Luigi: *See*—
Eaton, Philip; Nodari, Nereo; Neri, Carlo; Cassar, Luigi; Monti, Fabio; and Alberici, Fausto, 4,943,302, Cl. 44-56.000.

Cassidy, Frederick: *See*—
Evans, John M.; Stemp, Geoffrey; Burrell, Gordon; and Cassidy, Frederick, 4,943,582, Cl. 514-320.000.

Cavallerano, Alan P.: *See*—
Bakhmutsky, Michael; Cavallerano, Alan P.; Tsinberg, Mikhail; and Basile, Carlo, 4,943,856, Cl. 358-141.000.

CB Labs, Inc.: *See*—
Christian, David E., 4,944,016, Cl. 381-74.000.

Cebal: *See*—
Courtois, Michel; and Fillon, Jacques, 4,942,718, Cl. 53-435.000.
Schneider, Bernard, 4,942,981, Cl. 222-94.000.

Cedro, Vito, III.: *See*—
Dastolfo, LeRoy E., Jr.; and Cedro, Vito, III., 4,943,426, Cl. 423-497.000.

Cegedur Societe de Transformation de l'Aluminum Pechiney: *See*—
Raynaud, Guy-Michel; Realis, Louis; and Constant, Didier, 4,943,000, Cl. 228-193.000.

Celltech Limited: *See*—
Thompson, Philip W.; and Wood, Lesley A., 4,943,535, Cl. 435-311.000.

Central Glass Company, Limited: *See*—
Horiki, Yoshio; and Ikeda, Hideo, 4,943,179, Cl. 403-269.000.

Centre National de la Recherche Scientifique: *See*—
Jolles, Pierre; Fiat, Anne-Marie; Soria, Claudine; Levy-Toledano Sylviane; Raha, Sanghamitra; Mazoyer, Elisabeth; and Drouet, Ludovic, 4,943,562, Cl. 514-18.000.

Centre National d'Etudes Spatiales: *See*—
Dulck, Jean-Francois; and Rouffet, Denis, 4,943,808, Cl. 342-356.000.

Centron Corporation: *See*—
Simmons, Pat, 4,943,094, Cl. 285-333.000.

Cerdan, Juan M.: *See*—
Bailey, Douglas J.; Boymel, Paul; and Cerdan, Juan M., 4,943,465, Cl. 428-102.000.

Cerola, Joseph J.: *See*—
Rabenau, Richard; Kanner, Rowland W.; and Cerola, Joseph J., 4,943,704, Cl. 219-275.000.

Ceske vysoke uceni technicke v Praze: *See*—
Slovak, Petr, 4,942,880, Cl. 128-734.000.

Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; and Sircar, Jagadish C., to Warner-Lambert Company. Hydroxamate derivatives of selected nonsteroidal antiinflammatory acyl residues and their use for cyclooxygenase and 5-lipoxygenase inhibition. 4,943,587, Cl. 514-415.000.

Cetus Corporation: *See*—
Nitecki, Danute E.; and Aldwin, Lois, 4,943,636, Cl. 546-294.000.

Chaddock, Michael H.: *See*—
Morton, Bruce L.; Eagles, Bruce E.; and Chaddock, Michael H., 4,943,948, Cl. 365-201.000.

Chaffee, Donald L.: *See*—
Dobson, W. Kurt; and Chaffee, Donald L., 4,943,980, Cl. 375-42.000.

Chalifoux, Raymond J.; and Kozachuk, John, to Polysar Limited. Heat exchanger leak detection. 4,942,920, Cl. 165-1.000.

Chambers, Ronald E.: *See—*
Beasley, Craig J.; Lynn, Walter S.; and Chambers, Ronald E., 4,943,950, Cl. 367-50.000.

Chang, Clarence D.; Han, Scott; and Pelrine, Bruce P., to Mobil Oil Corporation. Activation of zeolites. 4,943,545, Cl. 502-56.000.

Chang, Jung-Shih. Manufacturing process for wooden cues to provide permanent straightness. 4,943,333, Cl. 156-153.000.

Chang, Mei-Yin. Device for communicating a doorside intercom set with a remote telephone. 4,943,997, Cl. 379-160.000.

Chapman, Leonard T., to Leonard Studio Equipment. Wheel unit. 4,943,101, Cl. 295-8.500.

Charles, Richard J.: *See—*
Ngo, Khai D. T.; and Charles, Richard J., 4,943,793, Cl. 336-83.000.

Charmot, Dominique; and Fiard, Jean-Francois, to Rhone-Poulenc Chimie. Metallized particles of crosslinked polymer, process for their preparation and their application in the manufacture of electrically conductive materials. 4,943,482, Cl. 428-407.000.

Chart Industries Ltd.: *See—*
Wickmann, John T.; and Carlton, Phillip, 4,942,666, Cl. 33-203.180.

Charzewski, Jan. Multi-jaw forming press especially suited for details of variable sections. 4,942,756, Cl. 72-399.000.

Chase, Eric T.: *See—*
Johnson, Carl E. A.; Ormsby, Jay L.; Chase, Eric T.; Quackenbos, George S.; Broude, Sergey V.; and Bou dour, Abdu, 4,943,734, Cl. 250-572.000.

Chauvin, Yves: *See—*
Dang Vu, Quang; and Chauvin, Yves, 4,943,669, Cl. 585-503.000.

Chefson, Patrice, to Spiragaine S.A. Sleeves for unloading. 4,942,953, Cl. 193-25.00C.

Chemical Fabrics Corporation: *See—*
Sahatjian, Ronald A.; Ribbins, Robert C., III; and Steckel, Mark G., 4,943,473, Cl. 428-245.000.

Chemipro Kasei Kaisha, Ltd.: *See—*
Seino, Shuichi; and Fujino, Tomizo, 4,943,637, Cl. 548-260.000.

Chen, Chyi-Song: *See—*
Wang, David; and Chen, Chyi-Song, 4,943,693, Cl. 200-304.000.

Chen, Sy-Hwa: *See—*
Sung, Chien-Min; Chen, Sy-Hwa; Merrill, Leo; and Bigelow, Louis K., 4,943,488, Cl. 428-552.000.

Chevron Research Company: *See—*
Miller, Stephen J., 4,943,424, Cl. 423-328.000.

Chihara, Kazuhiro: *See—*
Toshiyasu, Masayuki; Chihara, Kazuhiro; and Iwasaki, Yasuo, 4,943,755, Cl. 315-8.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt: *See—*
Angyan, Sandor; Oros, Gyula; Racz, Istvan; and Detre, Tamas, 4,943,678, Cl. 514-374.000.
Detre, Tamas; Angyan, Sandor; Pap, Laszlo; Szego, Andras; Karadi, Zoltan; Bertus nee Bende, Klara; and Marmarosi nee Kellner, Katalin, 4,943,307, Cl. 71-3.000.

Chisso Corporation: *See—*
Furukawa, Kenji; and Terashima, Kanetsugu, 4,943,387, Cl. 252-299.670.
Inoue, Hiromichi; Inukai, Takashi; Saito, Shinichi; Miyazawa, Kazutoshi; and Ohno, Kouji, 4,943,385, Cl. 252-299.610.
Kawabata, Hiroshi; Kobayashi, Katsuhiko; and Sato, Hideo, 4,943,512, Cl. 430-197.000.

Chiyoda Kenki Co., Ltd.: *See—*
Takemae, Eiji; Koizumi, Masakazu; and Ishibashi, Tadashi, 4,942,905, Cl. 138-118.000.

Cho, Ching-Chi. Exhaust gas purifying system. 4,943,306, Cl. 44-228.000.

Cho, Soo S., to Macho Products, Inc. Protective arm gear. 4,942,624, Cl. 2-16.000.

Choay, Jean: *See—*
Jacquinet, Jean-Claude; Petitou, Maurice; Sinay, Pierre; and Choay, Jean, 4,943,630, Cl. 536-123.000.

Choay, S.A.: *See—*
Jacquinet, Jean-Claude; Petitou, Maurice; Sinay, Pierre; and Choay, Jean, 4,943,630, Cl. 536-123.000.

Chollet, Hugues: *See—*
Maupu, Jean-Louis; Chollet, Hugues; Caroff, Pierre; and Duhot, Denis, 4,943,772, Cl. 324-207.200.

Chou, Der-Jeou; and Young, John C., to Young, John C. Thermoelectric generator for use in a heater and method of installation. 4,942,863, Cl. 126-110.00E.

Christensen, James J., deceased: *See—*
Bradshaw, Jerald S.; Izatt, Reed M.; Bruening, Ronald L.; and Christensen, James J., deceased, 4,943,375, Cl. 210-674.000.

Christensen, Virginia, successor in title: *See—*
Bradshaw, Jerald S.; Izatt, Reed M.; Bruening, Ronald L.; and Christensen, James J., deceased, 4,943,375, Cl. 210-674.000.

Christian, David E., to CB Labs, Inc. Portable musical instrument amplifier. 4,944,016, Cl. 381-74.000.

Christner, Juergen; Pfleiderer, Ernst; Taeger, Tilman; and Bernschein, Ursula, to Rohm GmbH. Liquid enzyme preparations. 4,943,530, Cl. 435-188.000.

Chu, Tsuwei: *See—*
Scherzinger, William M.; Chu, Tsuwei; and Kasdan, Leon M., 4,943,746, Cl. 310-61.000.

Chuan, Chang C. Stabilized and foldable safety inflatable boat. 4,942,839, Cl. 114-345.000.

Chujo, Yoshiki; Inoue, Tokuta; Konomi, Toshiaki; and Hyodo, Yoshihiko, to Toyota Jidosha Kabushiki Kaisha. Engine control system. 4,942,860, Cl. 123-571.000.

Chuo Electronics Co., Ltd.: *See—*
Shiota, Tsuneo; and Takeuchi, Soji, 4,943,854, Cl. 358-108.000.

Church & Dwight Co., Inc.: *See—*
Winston, Anthony E.; and Miskewitz, Regina M., 4,943,429, Cl. 424-52.000.

Ciba-Geigy Corporation: *See—*
Phillips, Emyr; Neil, Robert M.; and Wirth, Hermann O., 4,943,381, Cl. 252-51.50R.

Cien, Emmanuel C.: *See—*
Cien, Timothy P.; and Cien, Emmanuel C., 4,943,021, Cl. 248-167.000.

Cien, Timothy P.; and Cien, Emmanuel C. Guitar stand. 4,943,021, Cl. 248-167.000.

Cimflex Teknowledge Corporation: *See—*
Lark, Jay S.; Erman, Lee D.; Fehling, Michael; and Hayes-Roth, Frederick, 4,943,932, Cl. 364-513.000.

Cincinnati Milacron Inc.: *See—*
Wisbey, Jerry D., 4,943,338, Cl. 156-433.000.

Citta, Richard W.; Gosc, Paul M.; Mutzabaugh, Dennis M.; and Sgrigonoli, Gary J., to Zenith Electronics Corporation. Secure data packet transmission system and method. 4,944,006, Cl. 380-20.000.

City of Hope: *See—*
Hogan, J. Martin, 4,943,283, Cl. 604-198.000.

Clarion Co., Ltd.: *See—*
Kurihara, Takao; Hamatsu, Masahiro; and Mori, Masaharu, 4,943,975, Cl. 375-1.000.
Mitsutsuka, Syuichi, 4,943,751, Cl. 310-313.00D.
Uchida, Yoshitaka; and Kato, Kouichi, 4,943,977, Cl. 375-1.000.

Clark, Carl E., to International Business Machines Corporation. Operating system accessing control blocks by using home address space segment table to control instruction and operand fetch and store operations. 4,943,913, Cl. 364-200.000.

Clark, Jack; and Geddes, Norman K., to BHP Rail Products, Inc. Rail fastening means. 4,943,006, Cl. 238-349.000.

Clark, Stuart A.: *See—*
Bowe, Michael J.; and Clark, Stuart A., 4,943,007, Cl. 239-405.000.

CLASS OHG: *See—*
Diekhaus, Norbert; Fitzner, Werner; and Ostrup, Heinrich, 4,942,724, Cl. 56-10.400.

Claus, Thomas H.: *See—*
DeVries, Vern G.; Claus, Thomas H.; Floyd, Middleton B., Jr.; and Ayral-Kaloustian, Semiramis, 4,943,629, Cl. 536-117.000.

Clayson, Andrew, to Pacson Limited. Flow control valve. 4,943,033, Cl. 251-88.000.

Cocolios, Panayotis: *See—*
Ledon, Henry; Louise, Jean; and Cocolios, Panayotis, 4,943,422, Cl. 423-242.000.

Codar Technology, Inc.: *See—*
Campbell, W. Carroll; Evans, Michael W.; Browning, Edward A., Jr.; and Stone, Robert J., 4,943,762, Cl. 323-284.000.

Coderre, James C.: *See—*
Bacon, Chester A., Jr.; and Coderre, James C., 4,943,139, Cl. 350-105.000.

Coe, Charles G.; and Gaffney, Thomas R., to Air Products and Chemicals, Inc. Process for the purification of bulk gases using chabazite adsorbents. 4,943,304, Cl. 55-66.000.

Cofield, Dennis H. High speed leak tester. 4,942,758, Cl. 73-49.200.

Cognasse, Christian; Graham, Peter; Maury, Bernard; and Walter, Jean-Claude, to Horlogerie Photographique Francaise. Electroacoustic insert with added coil. 4,944,017, Cl. 381-79.000.

Colbert, Mary T. Wire frame for living plant wreath. 4,942,692, Cl. 47-41.120.

Coleman, James P.; Graham, Charles R.; and Monzyk, Bruce F., to Monsanto Company. Gallium complexes and solvent extraction of gallium. 4,943,646, Cl. 556-1.000.

Colery, Jean-Claude: *See—*
Bouillet, Edmond; Colery, Jean-Claude; Declerck, Claude; and Ledoux, Pierre, 4,942,800, Cl. 86-20.100.

Colleran, Stephen A.; Gugelmeyer, Robert J.; and Wilson, Bill B., to Molex Incorporated. Electrical terminal for bladed fuse. 4,943,248, Cl. 439-850.000.

Colorado Memory Systems, Inc.: *See—*
Cannon, Thomas G.; Roemmich, Bruce D.; and Precht, Terry A., 4,943,877, Cl. 360-106.000.
Godwin, Kurt E., 4,943,907, Cl. 364-200.000.

Columbia Research and Manufacturing Company: *See—*
Otto, Neal M., 4,943,814, Cl. 346-1.100.

Columbia University in the City of New York, The Trustees of: *See—*
Goff, Stephen P.; Tanese, Naoko; and Roth, Monica J., 4,943,531, Cl. 435-194.000.

Comalco Aluminum Limited: *See—*
Nixon, John C.; Eady, John A.; and Goodes, Christopher G., 4,943,367, Cl. 208-131.000.

Combs, Gary W.: *See—*
Jackman, Dennis E.; Combs, Gary W.; and Westphal, Dietmar B., 4,943,660, Cl. 564-18.000.

Comcheq Services Limited: *See—*
Kizuk, Brent L.; and Gurevich, Richard D., 4,944,001, Cl. 379-386.000.

Comer, Robert E. Elongated tray for supporting tubular objects. 4,942,965, Cl. 206-419.000.

Commu-Tec, Inc.: *See—*
Reynaert, Edward A., 4,943,685, Cl. 174-19.000.

Communications Satellite Corporation: *See*—
Zaghloul, Amir I., 4,943,809, Cl. 343-700.0MS.
Compagnie Plastic Omnium, S.A.: *See*—
Billon, Jean, 4,943,201, Cl. 414-408.000.
Complete Hydraulic Building Systems, Inc.: *See*—
Jones, Jimmie J.; Watson, Sherman L.; and Pence, Charles F., 4,942,701, Cl. 52-126.100.
Compositech Ltd.: *See*—
Medney, Jonas; and Klimpl, Fred E., 4,943,334, Cl. 156-174.000.
Comte de Lalaing: *See*—
Saxby, Michael E., 4,942,818, Cl. 102-444.000.
ConAgra, Inc.: *See*—
Rosenthal, Sallie W., 4,943,438, Cl. 426-92.000.
Conaway, Robert M., to Vital Force, Inc. Apparatus and method for the rapid attainment of high hydrostatic pressures and concurrent delivery to a workpiece. 4,942,750, Cl. 72-56.000.
Concept Inc.: *See*—
Rexroth, Frederick W.; and Bays, F. Barry, 4,943,290, Cl. 606-45.000.
Condos, Harry N.: *See*—
Gallacher, Lawrence V.; and Condos, Harry N., 4,943,656, Cl. 562-90.000.
Conley, Walter, III; and Kloptleisch, Kim A., to Crown Equipment Corporation. Control of hydraulic systems. 4,943,756, Cl. 318-671.000.
Connor, David T.: *See*—
Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; and Sircar, Jagadish C., 4,943,587, Cl. 514-415.000.
Conoco Inc.: *See*—
Gortowski, Edmund P., 4,943,370, Cl. 210-85.000.
Conrac Corporation: *See*—
Van Antwerp, Stanley R.; and Siehling, Mark B., 4,943,904, Cl. 363-144.000.
Consiglio Nazionale Delle Ricerche: *See*—
Casalbore-Miceli, Giuseppe; Beggiato, Giancarlo; DiMarco, Pier G.; and Giro, Gabriele, 4,943,499, Cl. 429-192.000.
Constansa, Jordi F.; Corominas, Juan P.; and Pinol, Augusto C., to Laboratorios Del Dr. Esteve, S.A. Benzimidazolesulfonamides and imidazopyridinesulfonamides, and their application as drugs. 4,943,570, Cl. 514-222.800.
Constant, Didier: *See*—
Raynaud, Guy-Michel; Realis, Louis; and Constant, Didier, 4,943,000, Cl. 228-193.000.
Conway Products Company: *See*—
Kantor, Paul; and Perry, Loren R., 4,942,630, Cl. 4-542.000.
Cook Pacemaker Corporation: *See*—
Goode, Louis; and Shipko, Frederick J., 4,943,289, Cl. 606-1.000.
Cooper Industries, Inc.: *See*—
Stewart, John F.; and Richardson, Russell D., 4,942,791, Cl. 81-177.100.
Cooper, Robin A.; and Fazackerley, Barry J., to Hugh Steeper Limited. Battery and battery receptacle arrangement. 4,943,498, Cl. 429-97.000.
Copprue, Judy. Scarf. 4,942,627, Cl. 2-207.000.
Cordwell, Brian; and Hayes, Paul M., to Plessey Overseas Limited. Digital control of phase locked loops. 4,943,786, Cl. 331-1.00A.
Corey, Elias J., to President & Fellows of Harvard College. Enantioselective reduction of ketones. 4,943,635, Cl. 546-13.000.
Corhart Refractories Corporation: *See*—
McGarry, Charles N.; Miller, Clarence W. J.; and Wehrenberg, Thomas M., 4,943,544, Cl. 501-124.000.
Corley, Deryl. Weighted warmup ball. 4,943,055, Cl. 273-26.00R.
Cornell Research Foundation, Inc.: *See*—
Mutschler, Martha A.; and Steffens, John C., 4,943,563, Cl. 514-23.000.
Cornerboard, Inc.: *See*—
Macaluso, Vincent A.; and Hade, Conrad, 4,942,830, Cl. 108-111.000.
Corning Incorporated: *See*—
Reding, Bruce W., 4,943,157, Cl. 356-1.000.
Corominas, Juan P.: *See*—
Constansa, Jordi F.; Corominas, Juan P.; and Pinol, Augusto C., 4,943,570, Cl. 514-222.800.
Cotic, Dennis J., to Oak Industries, Inc. Method and apparatus for automatically setting rail tie plates. 4,942,822, Cl. 104-16.000.
Courtaulds Packaging Australia Limited: *See*—
Anderson, Ian M., 4,942,716, Cl. 53-426.000.
Courtois, Michel; and Fillon, Jacques, to Cebal. Process for the packaging of lids. 4,942,718, Cl. 53-435.000.
Cowley, Nicholas P., to Plessey Overseas Limited. Dividing mechanisms for frequency synthesizers. 4,943,981, Cl. 377-47.000.
Cox, David H.: *See*—
Andreas, David W.; and Cox, David H., 4,943,439, Cl. 426-107.000.
Coyle, Richard W.: *See*—
Giunta, Richard F.; Becker, Robert D.; Schwartz, Martin J.; Coyle, Richard W.; and Curcuru, Kevin H., 4,943,966, Cl. 371-11.100.
Craft, James A.: *See*—
Aldrich, Charles S.; Craft, James A.; Harden, James P.; Komplin, Steven R.; Rousey, William S.; Shah, Praful M.; Ward II, Earl D.; Wilzbach, Bernard L.; and King, Terry L., 4,943,815, Cl. 346-108.000.
Craig, Richard R.: *See*—
Stephens, Ronald R.; Craig, Richard R.; Yen, Huan W.; and Lind, Richard C., 4,943,782, Cl. 330-4.300.
Crampton, George H.: *See*—
Lucot, James B.; and Crampton, George H., 4,943,428, Cl. 424-10.000.
Creamer, Glenn E.: *See*—
Montoya, Maria T.; Norman, Alan B.; Sanders, Norman C., Jr.; and Creamer, Glenn E., 4,942,888, Cl. 131-359.000.
Cremer, Gertrud, to Pharm-Allergan GmbH. Pharmaceutical composition for the treatment of genetically caused degenerative retina diseases and a process for the preparation thereof. 4,943,575, Cl. 514-249.000.
Crews, Phillip; Matthews, Thomas R.; and Horton, Paul, to Syntex (U.S.A.) Inc.; and Univ. of California, The Regents of the. Anthelmintic dysinins of marine origin. 4,943,589, Cl. 514-468.000.
Criswell, Peter B., to Unisys Corporation. Isolation for failures of input signals supplied to dual modules which are checked by comparison. 4,943,969, Cl. 371-68.100.
Critchlow, David N., to International Mobile Machines Corporation. Subscriber unit for wireless digital telephone system. 4,943,983, Cl. 375-84.000.
Cros, Michel, to Societe Anonyme dite: Alsthom. Articulated coupling for two rail vehicles. 4,942,824, Cl. 105-4.300.
Cross, Eugene W., Jr., to Hughes Aircraft Company. Color projection system with a color correction wedge. 4,943,155, Cl. 353-33.000.
Crown Equipment Corporation: *See*—
Conley, Walter, III; and Kloptleisch, Kim A., 4,943,756, Cl. 318-671.000.
Crucible Materials Corporation: *See*—
Redmerski, Lawrence S.; Pinnow, Kenneth E.; and Eckenrod, John J., 4,942,922, Cl. 165-134.100.
Crystal Semiconductor: *See*—
Early, Adrian B.; Harris, Larry L.; and Callahan, Michael J., Jr., 4,943,807, Cl. 341-120.000.
Csont, Ernest. Apparatus and method for fabricating composite panels for use in concrete buildings. 4,943,336, Cl. 156-280.000.
Cummins Engine Company, Inc.: *See*—
Millsapps, Stuart C., Jr., 4,942,930, Cl. 175-228.000.
Cunningham, Donald J., to Morton Thiokol, Inc. Gas bag inflator with a two welded joint housing. 4,943,086, Cl. 280-741.000.
Curcuru, Kevin H.: *See*—
Giunta, Richard F.; Becker, Robert D.; Schwartz, Martin J.; Coyle, Richard W.; and Curcuru, Kevin H., 4,943,966, Cl. 371-11.100.
Cushman, William B., to United States of America, Navy. Scheiner-principle vernier optometer. 4,943,151, Cl. 351-203.000.
CX Corporation: *See*—
Fleckenstein, Allen E., 4,943,270, Cl. 493-10.000.
D. H. Haden Ltd.: *See*—
Duxbury, Eric, 4,943,703, Cl. 219-247.000.
Dabringhaus, Volker: *See*—
Dietz, Gunter; Dabringhaus, Volker; and Wegel, Peter, 4,943,124, Cl. 312-222.000.
Dahl, Warren, to SPS Technologies, Inc. Swaged collar fastener. 4,943,196, Cl. 411-361.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Nakamoto, Mitsuharu; Sano, Kazuhiko; and Kawasawa, Takashi, 4,943,555, Cl. 503-227.000.
Dai, Yeu J. Antislipping device for cars in a stationary state. 4,942,949, Cl. 192-1.320.
Daicel Chemical Industries, Ltd.: *See*—
Goto, Yukihisa; Masamoto, Kazuhisa; Yagihara, Hiroshi; Morishima, Yasuo; and Osabe, Hirokazu, 4,943,314, Cl. 71-94.000.
Sato, Masaru; and Tsukane, Nagayoshi, 4,943,957, Cl. 428-694.000.
Daikin Industries Ltd.: *See*—
Morita, Shigeru; and Oka, Masahiko, 4,943,653, Cl. 560-219.000.
Daimler-Benz AG: *See*—
Jurgens, Gunter, 4,942,785, Cl. 74-867.000.
Schober, Karl; and Schaub, Norbert, 4,942,762, Cl. 73-117.000.
Tank, Eggert, 4,943,413, Cl. 420-528.000.
Wagner, Wolf-Dietrich; Klumpp, Rolf; Strobel, Wolfgang; and Brenker, Gunter, 4,942,858, Cl. 123-193.00H.
Dainippon Ink & Chemicals, Inc.: *See*—
Takehara, Sadao; Fujisawa, Toru; Arai, Yoshi; and Kurokawa, Jitsuo, 4,943,386, Cl. 252-299.650.
Dakota Manufacturing Co., Inc.: *See*—
Hunt, William K., 4,943,106, Cl. 296-26.000.
Dallas Semiconductor Corporation: *See*—
Harrington, Thomas E., III, 4,943,537, Cl. 437-34.000.
Lee, Robert D.; and Dias, Donald R., 4,943,804, Cl. 340-825.310.
Damien, George. Dental hygiene device. 4,942,870, Cl. 128-66.000.
Dang Vu, Quang; and Chauvin, Yves, to Institut Francais du Petrole. Method according to the invention is notably applied to the selective dimerization of propylene into methyl-4-pentene-1. 4,943,669, Cl. 585-503.000.
Danieli & C. Officine Meccaniche SpA: *See*—
Benedetti, Giampietro; and Di Giusto, Bruno, 4,942,656, Cl. 29-527.600.
Dannoux, Thierry L.; Laroulandie, Pierre J.; and Themont, Jean-Pierre. Integrated optical component. 4,943,130, Cl. 350-96.120.
Dastolfo, LeRoy E., Jr.; and Cedro, Vito, III., to Aluminum Company of America. Method for regulating reaction temperature. 4,943,426, Cl. 423-497.000.
Data Card Japan Ltd.: *See*—
Hirano, Tadashi, 4,943,400, Cl. 264-113.000.
Daudelin, Abraham N.; Hartnett, Ronald J.; and O'Connell, William A., to AT&T Bell Laboratories. Semi-automated customer information system. 4,943,995, Cl. 379-67.000.

Davey Roofing, Inc.: *See*—
Flaherty, Brian J., 4,942,943, Cl. 182-231.000.

Davidson, James W.: *See*—
Radovan, Giuseppe; Blaseck, Klaus; Hoffmeister, Lothar; Westendorf, Helmut; Sandling, Michael J.; and Davidson, James W., 4,942,897, Cl. 137-454.200.

Davidson Textron Inc.: *See*—
Rhodes, Richard D., Jr., 4,943,107, Cl. 296-70.000.

Davis, Anton; Simmons, Kelvin A.; and Blair, Richard. Article of clothing for use as a condom. 4,942,885, Cl. 128-842.000.

Davis, Cecil J.; and Matthews, Robert, to Texas Instruments Incorporated. Vacuum slice carrier. 4,943,457, Cl. 428-35.200.

Davis, Louis. End dumping trailer. 4,943,118, Cl. 298-12.000.

Davis, Robert A.: *See*—
Lai, Hoi K.; Davis, Robert A.; and Blem, Allen R., 4,943,311, Cl. 71-90.000.

Davis, Shannon: *See*—
Drago, Russell S.; and Davis, Shannon, 4,943,644, Cl. 549-533.000.

Dawson, Elliott, to BioVentures, Inc. Simultaneous immunoassay for the determination of antigens and antibodies. 4,943,525, Cl. 435-7.000.

Deal, James F., III: *See*—
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; Deal, James F., III; and Bolden, Paul L., Jr., 4,943,390, Cl. 252-355.000.

Dear, Kenneth M.; and Turner, Philip J., to Interox Chemicals Limited. Oxidation process. 4,943,358, Cl. 204-157.930.

Declerck, Claude: *See*—
Bouillet, Edmond; Colery, Jean-Claude; Declerck, Claude; and Ledoux, Pierre, 4,942,800, Cl. 86-20.100.

Deere & Company: *See*—
Bowditch, Hoel L., 4,942,726, Cl. 56-17.200.
Moriarty, Kevin J., 4,942,934, Cl. 180-6.480.

Deflecto Corporation: *See*—
Meyer, Stephen T., 4,943,024, Cl. 248-316.700.

de Groot, Paul: *See*—
Vieux, Garard; Diaz, Francis; and de Groot, Paul, 4,943,254, Cl. 445-28.000.

Deichert, William G.; and Wrue, Richard J., to Bausch & Lomb Incorporated. Method of making variable modulus lenses. 4,943,150, Cl. 351-177.000.

Delacourt, Dominique; Papuchon, Michel; and Pocholle, Jean Paul, to Thomson-CSF. Electromagnetic wave modulator with quantum well structure and its use as a polarizer. 4,943,144, Cl. 350-354.000.

DeLapa, David J. Bean bag toss game targets. 4,943,065, Cl. 273-402.000.

Delgado, Kenneth L. Vehicle seat storage apparatus. 4,942,993, Cl. 224-275.000.

Dellinger, Rick L., to Babcock & Wilcox Company, The. Sintering prevention in stagnant zones of fluid bed boilers. 4,942,673, Cl. 34-10.000.

Delta Kogyo Co., Ltd.: *See*—
Miyamoto, Masanori, 4,942,651, Cl. 29-91.500.

Demetron Gesellschaft fuer Elektronik-Werkstoffe m.b.H.: *See*—
Schlamp, Guenther; Gall, Klaus P.; Langer, Adolf; and Ptaschek, Georg, 4,943,362, Cl. 204-298.130.

Demizu, Ichiro; Nakamura, Mitsutoshi; and Kohri, Toshitaro, to Minolta Camera Kabushiki Kaisha. White toner comprising titanium oxide of specified size. 4,943,506, Cl. 430-109.000.

Dennison, James L. Conduit-enclosed induction loop for a vehicle detector. 4,943,805, Cl. 340-933.000.

Dennison Manufacturing Company: *See*—
Isherwood, Harold; and Iles, Roy A. H., 4,943,446, Cl. 427-9.000.

Deri, Robert J.; and Kapon, Elyahou, to Bell Communications Research, Inc. Low loss semiconductor optical phase modulator. 4,943,133, Cl. 350-96.140.

De Robertis, Patrick: *See*—
Mertz, Jean-Luc; Guerin, Hubert; Perrot, Michel; and De Robertis, Patrick, 4,943,691, Cl. 200-151.000.

DeSoto, Inc.: *See*—
Noren, Gerry K.; and Murphy, Edward J., 4,943,600, Cl. 522-106.000.

Desrosiers, J. Armand. Plant harvester. 4,942,722, Cl. 56-8.000.

Dessanti, Daniel J.: *See*—
Markbreiter, Stephen J.; Dessanti, Daniel J.; and Schorr, Hans P., 4,942,734, Cl. 60-39.020.

Detre, Tamas; Angyan, Sandor; Pap, Laszlo; Szego, Andras; Karadi, Zoltan; Bertus nee Bende, Klara; and Marmarosi nee Kellner, Katalin, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Plant-protective pesticidal composition. 4,943,307, Cl. 71-3.000.

Detre, Tamas: *See*—
Angyan, Sandor; Oros, Gyula; Racz, Istvan; and Detre, Tamas, 4,943,678, Cl. 514-374.000.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See*—
Hoger, Ernst; and Obenauf, Eberhard, 4,942,661, Cl. 29-723.000.
Radovan, Giuseppe; Blaseck, Klaus; Hoffmeister, Lothar; Westendorf, Helmut; Sandling, Michael J.; and Davidson, James W., 4,942,897, Cl. 137-454.200.

Deutsche Texaco Aktiengesellschaft: *See*—
Osterburg, Gunther; and Prezelj, Milan, 4,943,354, Cl. 203-14.000.

Devitt, Francis: *See*—
Byrne, John V.; McMullin, Francis; Devitt, Francis; O'Dwyer, Jeremiah; Murphy, John; Egan, Michael; Brosnan, Michael; and Lawton, James, 4,943,760, Cl. 318-701.000.

DeVries, Vern G.; Claus, Thomas H.; Floyd, Middleton B., Jr.; and Ayral-Kaloustian, Semiramis, to American Cyanamid Company. Antidiabetic alpha-substituted phosphonates. 4,943,629, Cl. 536-117.000.

De With, Gijsbertus: *See*—
Severin, Jan W.; and De With, Gijsbertus, 4,943,559, Cl. 505-1.000.

Dewitz, Thomas S., to Shell Oil Company. Aeration tube discharge control device with variable fluidic valve. 4,943,190, Cl. 406-134.000.

Dews, Edwin P.; Pierce, William E.; Gunnarson, John A.; and Ehrenfried, Albert D., to Metritape, Inc. Mounting head for a resistance-tape level sensor. 4,942,764, Cl. 73-301.000.

Diahatsu Motor Co., Ltd.: *See*—
Kido, Tomoyuki, 4,943,074, Cl. 280-91.000.

Dias, Donald R.: *See*—
Lee, Robert D.; and Dias, Donald R., 4,943,804, Cl. 340-825.310.

Diaz, Francis: *See*—
Vieux, Garard; Diaz, Francis; and de Groot, Paul, 4,943,254, Cl. 445-28.000.

Diaz, Manuel C., to Recycled Energy, Inc. Use of dewatered digested sewerage sludge as the bloating agent. 4,943,233, Cl. 432-13.000.

Dic-Hercules Chemicals, Inc.: *See*—
Takahashi, Mizunori; Ikeda, Tsuyoshi; and Yamaguchi, Yoshiharu, 4,943,608, Cl. 524-272.000.

Dicker, Ira B., to Du Pont de Nemours, E. I., and Company. Initiators for group transfer polymerization. 4,943,648, Cl. 556-470.000.

Dickey, John A. Vapor pressure retention apparatus. 4,942,969, Cl. 215-100.00R.

Diehl GmbH & Co.: *See*—
Bankel, Adolf; Strauss, Hans; and Kerk, Stephan, 4,942,816, Cl. 102-235.000.

Diekhans, Norbert; Fitzner, Werner; and Ostrup, Heinrich, to CLASS OHG. Apparatus and method for changing the position of a mowing mechanism. 4,942,724, Cl. 56-10.400.

Diekhaus, Gerhard; and Kappesser, Harald, to Hoechst Aktiengesellschaft. Process for the preparation of α-alkylacroleins. 4,943,663, Cl. 568-461.000.

Dieleman, Robert D.: *See*—
McGhie, James R.; and Dieleman, Robert D., 4,943,078, Cl. 280-408.000.

Diels, Gaston S. M.: *See*—
Janssens, Frans E.; Diels, Gaston S. M.; Torremans, Joseph L. G.; and Sommen, Francois M., 4,943,580, Cl. 514-303.000.

Diesel Kiki Co., Ltd.: *See*—
Iio, Masahiro, 4,943,216, Cl. 418-15.000.

Dietrich, Walter, to Leybold Aktiengesellschaft. Method and apparatus for cleaning sulphur and nitrogen containing flue gases by reaction under the action of electron beams. 4,943,356, Cl. 204-157.300.

Dietz, Gunter; Dabringhaus, Volker; and Wegel, Peter, to Gebr. Happich GmbH. Ashtray for vehicles. 4,943,124, Cl. 312-222.000.

DiFranco, A. Thomas: *See*—
Horvath, Bruce B.; Hurlbut, Raymond A.; DiFranco, A. Thomas; and Williams, Bruce R., 4,942,998, Cl. 228-102.000.

Digital Equipment Corporation: *See*—
Wilhelm, Neil C.; and Leonard, Judson S., 4,943,915, Cl. 364-200.000.

Di Giusto, Bruno: *See*—
Benedetti, Giampietro; and Di Giusto, Bruno, 4,942,656, Cl. 29-527.600.

DiMarco, Pier G.: *See*—
Casalbore-Miceli, Giuseppe; Beggiato, Giancarlo; DiMarco, Pier G.; and Giro, Gabriele, 4,943,499, Cl. 429-192.000.

Dinallo, Anthony J., Sr., to General Electric Company. Coating with improved adhesion. 4,943,601, Cl. 524-265.000.

Dittrich, Otto, to Reimers Getriebe AG. Continuously variable transmission system with by-pass check valves. 4,942,786, Cl. 74-867.000.

Dixit, Sunit S.: *See*—
Lazarus, Richard M.; Reardon, Edward J.; and Dixit, Sunit S., 4,943,511, Cl. 430-192.000.

Dixon, Leonard F.: *See*—
Rauscher, Elli; Griffiths, John; and Dixon, Leonard F., 4,943,526, Cl. 435-15.000.

Dixon, Paula D. Artificial flower construction. 4,943,455, Cl. 428-26.000.

Dobson, W. Kurt; and Chaffee, Donald L., to Intelligent Modem Corporation. Multi-carrier high speed modem. 4,943,980, Cl. 375-42.000.

Dockner, Toni; Sauerwald, Manfred; Krug, Herbert; and Irgang, Matthias, to BASF Aktiengesellschaft. Reductive dehalogenation of organic halogen compounds. 4,943,671, Cl. 585-642.000.

Dr. Ing. h.c.F. Porsche AG: *See*—
Batzill, Manfred, 4,942,761, Cl. 73-119.00R.

Dohi, Takeyoshi: *See*—
Funakubo, Hiroyasu; Dohi, Takeyoshi; Sakuma, Ichiro; and Komeda, Takashi, 4,943,296, Cl. 606-166.000.

Dom, Harry A.; and Maistros, John A., to National Machinery Company, The. Stock feed apparatus for forging machines and the like. 4,942,796, Cl. 83-72.000.

Dombek, Bernard D., to Union Carbide Chemicals and Plastics Company, Inc. Catalyst for synthesis of mixtures of methanol and higher alcohols. 4,943,551, Cl. 502-345.000.

Doorenbos, Daryl E. Device to aid in putting on elastic hose. 4,942,988, Cl. 223-111.000.

Dorris, Robert A.: *See*—
Brandon, Michael D.; Dorris, Robert A.; Garrett, Robert T.; Helton, Roy N.; Roney, Don G.; and Vinson, James R., 4,942,679, Cl. 36-102.000.

Dory, Jacques. Localization method and device for determining the degree of fragmentation of stones. 4,942,878, Cl. 128-660.030.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See*—
Sasaki, Noriaki; and Matsunaka, Kazuhisa, 4,943,395, Cl. 252-629.000.
Dosaka, Katsumi: *See*—
Komatsu, Takahiro; Kumanoya, Masaki; Dosaka, Katsumi; and Konishi, Yasuhiro, 4,943,960, Cl. 365-222.000.
Dossett, Richard A.: *See*—
Gakhar, Ved P.; Dossett, Richard A.; and McCord, Wilfred M., Jr., 4,942,912, Cl. 144-136.00C.
Douglas, Joseph S.: *See*—
Przybylowicz, Catherine S.; Jacobs, Merrit N.; and Douglas, Joseph S., 4,943,415, Cl. 422-56.000.
Douglas Press, Inc.: *See*—
Fienberg, Debra, 4,943,090, Cl. 273-139.000.
Dow Chemical Company, The: *See*—
Grunbauer, Henri J. M.; Thoen, Johan A.; and Smits, Guido F., 4,943,597, Cl. 521-167.000.
Martinez, Eloy C., 4,943,603, Cl. 523-220.000.
McCullough, Francis P., Jr.; and Snelgrove, R. Vernon, 4,943,478, Cl. 428-288.000.
McGrath, James E.; Yoo, Youngtai; Turner, Robert B.; and Lewis, Diane M., 4,943,626, Cl. 528-408.000.
Woo, Edmund P.; and Mullins, Michael J., 4,943,640, Cl. 548-551.000.
Drago, Russell S.; and Davis, Shannon, to University of Florida, The. Olefin and alkane oxidations, ruthenium carboxylate catalyst therefor and method of preparation thereof. 4,943,644, Cl. 549-533.000.
Drake, Timothy E.: *See*—
Quirk, Michael J.; Drake, Timothy E.; and Zarycki, John E., 4,942,776, Cl. 74-61.000.
Drehtainer Consulting GmbH: *See*—
Neugebauer, Peter; and Meyer, Helmut, 4,942,971, Cl. 220-1.500.
Dresser Industries, Inc.: *See*—
Themig, Daniel J., 4,942,925, Cl. 166-382.000.
Drexel Oilfield Services, Inc.: *See*—
Van Winkle, Denzal W., 4,943,031, Cl. 251-1.300.
Drilco Industrial, Inc.: *See*—
Waldrep, William N., 4,943,172, Cl. 384-565.000.
Drouet, Ludovic: *See*—
Jolles, Pierre; Fiat, Anne-Marie; Soria, Claudine; Levy-Toledano Sylviane; Raha, Sanghamitra; Mazoyer, Elisabeth; and Drouet, Ludovic, 4,943,562, Cl. 514-18.000.
Drucker, Jack L., Jr. Vehicle service reminder display. 4,942,841, Cl. 116-317.000.
Dry Dock Industries, Inc.: *See*—
Smith, Jon D., 4,943,253, Cl. 411-342.000.
Dubreux, Bernard; and Laviron, Charles, to Produits Chimiques Ugine Kuhlmann. Process for preparation of α-acetoxy-α-methyl-N,N'-diacetyl malonamide. 4,943,654, Cl. 560-251.000.
Duhot, Denis: *See*—
Maupu, Jean-Louis; Chollet, Hugues; Caroff, Pierre; and Duhot, Denis, 4,943,772, Cl. 324-207.200.
Dulck, Jean-Francois; and Rouffet, Denis, to Centre National d'Etudes Spatiales. Communications system with moving bodies with the aid of satellites. 4,943,808, Cl. 342-356.000.
Dumais, Arthur: *See*—
Koski, Richard D.; Kosco, William C.; and Dumais, Arthur, 4,943,773, Cl. 324-207.130.
Dumican, Barry L.: *See*—
Hlavacek, Robert A.; Dumican, Barry L.; and McCusker, Edward J., 4,942,875, Cl. 606-230.000.
Duncan, Stewart M. Liner setting assembly and method. 4,942,924, Cl. 166-290.000.
Dunnion, Dermot, to Advanced Micro Devices. Full-duplex modem using a single processor. 4,943,942, Cl. 364-900.000.
Du Pont de Nemours, E. I., and Company: *See*—
Dicker, Ira B., 4,943,648, Cl. 556-470.000.
Hay, James V.; and Wolf, Anthony D., 4,943,312, Cl. 71-90.000.
Kafka, Fred Y.; Bice, Archie R.; and Burchett, Donald K., 4,943,402, Cl. 264-141.000.
DuPont, Stephen. Articulated hydrofoil oar. 4,943,250, Cl. 440-101.000.
Duprat, Annette P.: *See*—
Baziard, Yves; Brun, Robert; and Duprat, Annette P., 4,943,453, Cl. 427-309.000.
Dupraz, Jean-Pierre; and Moncorge, Jean-Paul, to GEC Alsthom SA. Circuit for measuring voltages in a three-phase installation, in particular an installation of the metalclad type. 4,943,765, Cl. 324-107.000.
Dural Aluminum Composites Corp.: *See*—
Bruski, Richard S.; Hudson, Larry G.; and Skibo, Michael D., 4,943,490, Cl. 428-614.000.
Durhman, Paul P., to Advanced Fiber Products. Interlocking corner plug system. 4,943,180, Cl. 403-295.000.
Duszlak, James: *See*—
Winthrop, John T.; Menyhart, Alexander F.; and Duszlak, James, 4,942,696, Cl. 51-277.000.
Dutch Drilling B.V.: *See*—
Verstraeten, Alexander J., 4,943,189, Cl. 405-267.000.
Duttine, Walter: *See*—
Bonifer, Edgar; Duttine, Walter; Jahns, Werner; and Kratz, Helmut, 4,942,957, Cl. 198-781.000.
Duxbury, Eric, to D. H. Haden Ltd. Appliance stand having an electrical connector. 4,943,703, Cl. 219-247.000.
Dyksterhouse, Joel A.: *See*—
Dyksterhouse, Robert; Dyksterhouse, Joel A.; Handermann, Alan C.; and Western, Edward D., 4,943,472, Cl. 428-240.000.
Dyksterhouse, Robert; Dyksterhouse, Joel A.; Handermann, Alan C.; and Western, Edward D., to BASF Aktiengesellschaft. Improved preimpregnated material comprising a particulate thermosetting resin suitable for use in the formation of a substantially void-free fiber-reinforced composite article. 4,943,472, Cl. 428-240.000.
Dykstra, Jerald P.; and Ray, Andrew M., to Eaton Corporation. Beam pattern control system for an ion implanter. 4,943,728, Cl. 250-492.300.
Dylist, Inc.: *See*—
Link, Donald J.; and Stanley, Lonnie D., 4,942,689, Cl. 43-42.240.
Dynamic Air Inc.: *See*—
Steele, James R., 4,943,163, Cl. 366-106.000.
E. M. B. Corporation: *See*—
Staples, Paul R., 4,943,696, Cl. 200-407.000.
Eady, John A.: *See*—
Nixon, John C.; Eady, John A.; and Goodes, Christopher G., 4,943,367, Cl. 208-131.000.
Eagle Industry Co., Ltd.: *See*—
Jinnouchi, Takeshi, 4,943,069, Cl. 277-27.000.
Early, Adrian B.; Harris, Larry L.; and Callahan, Michael J., Jr., to Crystal Semiconductor. Digitally calibrated delta-sigma analog-to-digital converter. 4,943,807, Cl. 341-120.000.
Eastern Company, The: *See*—
Pastva, John V., 4,943,110, Cl. 296-181.000.
Eastman Kodak Company: *See*—
Przybylowicz, Catherine S.; Jacobs, Merrit N.; and Douglas, Joseph S., 4,943,415, Cl. 422-56.000.
Reithel, Raymond F.; and Sutton, Richard C., 4,943,514, Cl. 430-270.000.
Eaton Corporation: *See*—
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Edler, James P.; and Lisowsky, Bohdan, 4,943,401, Cl. 264-63.000.
Mengel, Keith E., 4,943,698, Cl. 219-121.470.
Eaton, Philip; Nodari, Nereo; Neri, Carlo; Cassar, Luigi; Monti, Fabio; and Alberici, Fausto, to Enichem Synthesis S.p.A.; and AGIP Petroli S.p.A. Fuel composition with a high energy content. 4,943,302, Cl. 44-56.000.
EB Norsk Kabel a.s: *See*—
Jacobsen, Clas T., 4,942,903, Cl. 138-110.000.
Ebara Corporation: *See*—
Niimura, Yoshihiro; Kikuta, Ritsuo; and Usui, Katsuaki, 4,943,214, Cl. 418-9.000.
Eberhart, Suzanne T.: *See*—
Band, Elliot I.; and Eberhart, Suzanne T., 4,943,647, Cl. 556-426.000.
Ebert, Wolfgang; Meyer, Rolf-Volker; and Kreuder, Hans-Joachim, to Bayer Aktiengesellschaft. Process for the production of polyesters and their use as binder or binder component in powder lacquers. 4,943,623, Cl. 528-272.000.
ECIA - Equipments et Composants pour l'Industrie Automobile: *See*—
Hoblingre, Andre , 4,943,182, Cl. 403-349.000.
Eckenrod, John J.: *See*—
Redmerski, Lawrence S.; Pinnow, Kenneth E.; and Eckenrod, John J., 4,942,922, Cl. 165-134.100.
Ecklund, Lawrence M., to Motorola, Inc. Circuit for controlling operator indicators in an AM stereo receiver. 4,944,011, Cl. 381-15.000.
Eclectica, Inc.: *See*—
Femano, Philip A.; and Zanakis, Michael F., 4,943,852, Cl. 358-88.000.
Economou, Nicholas P., to Micrion Corporation. Method and apparatus for defect detection and location. 4,943,732, Cl. 250-572.000.
Edahiro, Takeshi: *See*—
Kijima, Takao; Edahiro, Takeshi; Koyama, Toshihide; and Taniguchi, Haruyuki, 4,943,082, Cl. 280-673.000.
Edelson, Nathan A.: *See*—
Bogart, Larry; Hipkins, James J.; and Edelson, Nathan A., 4,943,350, Cl. 162-158.000.
Edler, James P.; and Lisowsky, Bohdan, to Eaton Corporation. Process for making silicon nitride articles. 4,943,401, Cl. 264-63.000.
Edmundson, James T.: *See*—
Jenkins, David P.; and Edmundson, James T., 4,943,231, Cl. 431-215.000.
Edwards, Judy S. Apparatus for applying earlobe medication. 4,943,274, Cl. 604-2.000.
Edwards, M. Earl; and May, James G., to Astec Industries, Inc. Portable self-erecting asphalt storage apparatus and method of erecting same. 4,943,200, Cl. 414-332.000.
Egan, Michael: *See*—
Byrne, John V.; McMullin, Francis; Devitt, Francis; O'Dwyer, Jeremiah; Murphy, John; Egan, Michael; Brosnan, Michael; and Lawton, James, 4,943,760, Cl. 318-701.000.
Ehara, Shaw: *See*—
Nojima, Hideo; Kojima, Yoshimi; Imada, Eiji; Matsuyama, Toshiro; Hayakawa, Takashi; Narikawa, Shiro; and Ehara, Shaw, 4,943,503, Cl. 430-66.000.
Ehrenfried, Albert D.: *See*—
Dews, Edwin P.; Pierce, William E.; Gunnarson, John A.; and Ehrenfried, Albert D., 4,942,764, Cl. 73-301.000.
Ehrlich, Rodney P. Drop frame trailer construction. 4,943,204, Cl. 414-495.000.
Eicher, Helmut M., to U.S. Philips Corporation. Arrangement for position indication of an edge of a sheet-shaped data carrier. 4,943,174, Cl. 400-703.000.
Eichhorn, Horst: *See*—
Hoffmann, Martin; Schittenheim, Helge; Wierschem, Franz-Rudolf; and Eichhorn, Horst, 4,943,028, Cl. 248-548.000.

Eidenschink, Rudolf: *See*—
Sucrow, Wolfgang; Wolter, Herbert; and Eidenschink, Rudolf, 4,943,384, Cl. 252-299.610.

Eiji, Iwasaki: *See*—
Kageyama, Sadashi; Abe, Yoshio; Yasumoto, Yoshio; Inoue, Shuji; Takai, Hitoshi; Matsumoto, Mitsujiro; Aono, Kouji; Uchimura, Kiyoshi; and Eiji, Iwasaki, 4,944,032, Cl. 358-12.000.

Eisenbraun, Allan A.: *See*—
Klobucar, W. Dirk; Eisenbraun, Allan A.; and Zumstein, Ronald C., 4,943,682, Cl. 528-353.000.

Eisengiesserei Monforts GmbH & Co.: *See*—
Kallen, Wilhelm; and Quack, Ulrich, 4,942,915, Cl. 164-34.000.

Eisenmann, Siegfried A.; and Harle, Hermann. Automatic two-speed transmission for the drive of auxiliary units of a motor vehicle engine. 4,943,268, Cl. 475-95.000.

Eisinger, Robert W.; Khalil, Mohammed H.; Katz, David H.; and Sargeant, Robert B., to Quidel. Lateral flow, non-bibulous membrane assay protocols. 4,943,522, Cl. 435-7.000.

Ekern, Judy M.: *See*—
Vandnais, Timothy W.; Ekern, Judy M.; and Hennenfent, Douglas J., 4,942,658, Cl. 29-603.000.

Elberbaum, David, to Elbex Video, Ltd. Closed circuit television apparatus for supervisory system. 4,943,864, Cl. 358-108.000.

Elbex Video, Ltd.: *See*—
Elberbaum, David, 4,943,864, Cl. 358-108.00C.

Eli Lilly and Company: *See*—
Burow, Kenneth W., Jr., 4,943,634, Cl. 544-224.000.

Ellicott Machine Corporation: *See*—
McDowell, Alexander W. K., 4,942,682, Cl. 37-66.000.

Ellison, Thomas M.; and Winton, Robert A., to Rexham Corporation. Method of making a decorative sheet material simulating the appearance of a base coat/clear coat paint finish. 4,943,680, Cl. 427-154.000.

Elvert Edgar Oest & Company: *See*—
Humpherys, Allan S.; and Oest, Elvert E., 4,943,184, Cl. 405-39.000.

Emberson, John E., to Enpoco Limited. Drain suited for installation in wooden floors. 4,943,100, Cl. 210-164.000.

Emma, Philip G.; Knight, Joshua W., III; Pomerene, James H.; Rechtschaffen, Rudolph N.; and Sparacio, Frank J., to International Business Machines Corporation. Multiple branch analyzer for prefetching cache lines. 4,943,908, Cl. 364-200.000.

Emori, Kiyoshi, to Minolta Camera Kabushiki Kaisha. Image forming apparatus. 4,943,832, Cl. 355-313.000.

Ems-Inventa AG: *See*—
Hewel, Manfred; Lavalette, Annette; and Annighofer, Frank, 4,943,625, Cl. 528-324.000.

Emson Research Inc.: *See*—
Schultz, Robert S., 4,942,985, Cl. 222-376.000.

Emulsion Technology, Inc.: *See*—
Weete, John D.; and Griffith, George L., 4,943,389, Cl. 252-308.000.

Enderle, Eckhard; Aehnelt, Hans-Peter; and Kaufmann, Dieter, to Carl-Zeiss-Stiftung. Probe head mount for a deflectable probe or the like. 4,942,671, Cl. 33-559.000.

Endo, Shigeo; Kawashima, Haruo; Hirata, Kimio; Saito, Yasuo; Uchiya, Takao; and Yanagi, Hideo, to Toshiba Monofrax Co., Ltd. Method for manufacturing a fused cast refractory. 4,943,398, Cl. 264-82.000.

Engineering & Precision Machining, Inc.: *See*—
Lee, Harry E., Jr., 4,943,293, Cl. 606-96.000.

Engles, Bruce E.: *See*—
Morton, Bruce L.; Engles, Bruce E.; and Chaddock, Michael H., 4,943,948, Cl. 365-201.000.

Enichem Synthesis S.p.A.: *See*—
Eaton, Philip; Nodari, Nereo; Neri, Carlo; Cassar, Luigi; Monti, Fabio; and Alberici, Fausto, 4,943,302, Cl. 44-56.000.

Ennis, John W. Flexible container holder with integral handles. 4,943,017, Cl. 248-102.000.

Enpoco Limited: *See*—
Emberson, John E., 4,943,100, Cl. 210-164.000.

Environmental Technology (U.S.), Inc.: *See*—
Legare, Thomas G., III, 4,943,377, Cl. 210-709.000.

Enzo Biochem, Inc.: *See*—
Stavrianopoulos, Jannis G., 4,943,523, Cl. 435-7.000.

Equipment Merchants International: *See*—
Hale, Roger W.; and Senk, Gerald B., Jr., 4,942,916, Cl. 164-166.000.

Erickson, Frederick L.: *See*—
Richeson, William E.; and Erickson, Frederick L., 4,942,852, Cl. 123-90.140.

Erickson, Warren R.; and Siewert, Robert L., to Trackmobile, Inc. Vehicle having variable gauge rail wheels. 4,942,826, Cl. 105-178.000.

Ericsson Paging Systems B.V.: *See*—
Vrijkorte, Marcel J. G., 4,943,803, Cl. 340-825.490.

Erlich, Frederick L. Sheath for devices for injecting or withdrawing body fluids. 4,943,284, Cl. 604-263.000.

Erman, Lee D.: *See*—
Lark, Jay S.; Erman, Lee D.; Fehling, Michael; and Hayes-Roth, Frederick, 4,943,932, Cl. 364-513.000.

Ernest, Ethan. Apparatus for manufacturing corrugated plywood composites. 4,943,339, Cl. 156-443.000.

Erni, Markus, to Maschinenfabrik Rieter AG. Communications system for an installation and method of controlling such installation. 4,944,033, Cl. 364-470.000.

Esposito, Frank. Stove-top safety grate flame deflector. 4,942,864, Cl. 126-214.00D.

Estrada, Julio R.; and Yarbrough, Roy L., to National Semiconductor Corporation. ECL/CML emitter follower current switch circuit. 4,943,741, Cl. 307-455.000.

ETA SA Fabriques d'Ebauches: *See*—
Gognist, Paul, 4,942,755, Cl. 72-254.000.

Ethyl Corporation: *See*—
Klobucar, W. Dirk; Eisenbraun, Allan A.; and Zumstein, Ronald C., 4,943,682, Cl. 528-353.000.

Etta Industries, Inc.: *See*—
Quazi, Fazle S., 4,943,886, Cl. 361-42.000.

Etzbach, Karl-Heinz; and Hisgen, Bernd, to BASF Aktiengesellschaft. Liquid crystalline copolymer. 4,943,617, Cl. 525-329.900.

Eubanks Engineering Co.: *See*—
Hoffa, Jack L.; and Nazerian, Greg, 4,942,789, Cl. 81-9.510.

Euteneuer, Charles L.; Mattison, Richard C.; Adams, Daniel O.; Hektner, Thomas R.; and Keith, Peter T., to SciMed Life Systems, Inc. Dilatation balloon catheter. 4,943,278, Cl. 604-96.000.

Evans, Francis E.; Schroeder, Kenneth H.; and Wagner, William J., to Allied-Signal Inc. Process for recovering boron trifluoride from an impure gaseous boron trifluoride residue. 4,943,423, Cl. 423-293.000.

Evans, John M.; Stemp, Geoffrey; Burrell, Gordon; and Cassidy, Frederick, to Beecham Group p.l.c. Active compounds. 4,943,582, Cl. 514-320.000.

Evans, Michael W.: *See*—
Campbell, W. Carroll; Evans, Michael W.; Browning, Edward A., Jr.; and Stone, Robert J., 4,943,762, Cl. 323-284.000.

Evers, Paulus H. J. M. Foamable alcohol product and process of producing a foamable alcohol product. 4,943,443, Cl. 426-569.000.

Exxon Chemical Patents Inc.: *See*—
Gutierrez, Antonio; and Lundberg, Robert D., 4,943,382, Cl. 252-51.50A.

Exxon Research and Engineering Company: *See*—
Hamner, Glen P., deceased; Boucher, Heather A.; and Wachter, William A., 4,943,672, Cl. 585-737.000.

Ezawa, Hiroshi; Nakakura, Toshiyuki; Watanabe, Takayuki; and Tsushima, Hiroaki, to Mitsui Toatsu Chemicals, Incorporated. Polyimide foam. 4,943,594, Cl. 521-79.000.

Fabcon, Inc.: *See*—
Nash, Richard C., 4,943,219, Cl. 425-64.000.

Fabriques de Tabac Reunies, S.A.: *See*—
Abdelgawad, Ahmed; Braem, Daniel; and Nyffeler, Urs, 4,942,887, Cl. 131-336.000.

Fabry, Bernd; and Piorr, Robert, to Henkel Kommanditgesellschaft auf Aktien. Process for the manufacture of ester sulfonate pastes of low viscosity. 4,943,393, Cl. 252-554.000.

Facchini, Libero, to I.M.A. Industria Macchine Automatiche S.p.A. Compressing machine for making tablets. 4,943,227, Cl. 425-345.000.

FAG Kugelfischer Georg Schafer (KGaA): *See*—
Hofmann, Heinrich; and Troster, Manfred, 4,943,171, Cl. 384-537.000.

Fairchild, John F.: *See*—
Muehlhausen, Robert A.; and Fairchild, John F., 4,943,880, Cl. 360-133.000.

Fankhauser, John H., II; and Todd, Thomas W., to User Friendly Foods, Inc. Deboning system and method of using same. 4,942,642, Cl. 17-46.000.

Fantasy Flavors Inc.: *See*—
Hamamura, Akimitsu, 4,942,910, Cl. 141-9.000.

Fanuc Ltd.: *See*—
Iwagaya, Takashi; and Nakazato, Tomomi, 4,943,905, Cl. 364-136.000.
Sakamoto, Keiji; and Yoshida, Osamu, 4,943,759, Cl. 318-568.110.

Farallon Computing Corporation: *See*—
Webber, Harold H., Jr., 4,943,979, Cl. 375-4.000.

Farley, Inc.: *See*—
Koch, Byron W.; and Badenhope, Robert I., 4,942,917, Cl. 164-369.000.

Faroudja, Yves C.; and Campbell, Jack J. Television transmission system having improved separation of audio and video spectra. 4,943,849, Cl. 358-12.000.

Farr, Andrew F.; and Radisch, Herbert R., Jr., to InterVentional Technologies, Inc. Method of manufacturing a cutter for atherectomy device. 4,942,788, Cl. 76-115.000.

Farrar, David: *See*—
Flesher, Peter; Farrar, David; and Field, John R., 4,943,378, Cl. 210-734.000.

Fast, Jacob. Shelf divider. 4,942,968, Cl. 211-184.000.

Fay, Fredric S.; Fogarty, Kevin E.; and Rodgers, Cyril, to University of Massachusetts Medical Center. Imaging microspectrofluorimeter. 4,943,142, Cl. 350-315.000.

Fazackerley, Barry J.: *See*—
Cooper, Robin A.; and Fazackerley, Barry J., 4,943,498, Cl. 429-97.000.

Federmann, Helmut: *See*—
Levacher, Friedrich K.; Federmann, Helmut; Noack, Georg; and Kraus, Anton, 4,943,714, Cl. 250-227.160.

Fehling, Michael: *See*—
Lark, Jay S.; Erman, Lee D.; Fehling, Michael; and Hayes-Roth, Frederick, 4,943,932, Cl. 364-513.000.

Felder, James G. Torsion-imparting blocking practice sled. 4,943,057, Cl. 273-55.00R.

Felstehausen, Eugene F., to FMC Corporation. Corn cutter and system. 4,943,259, Cl. 460-52.000.

Feltен & Guilleaume Energietechnik AG: *See*—
Levacher, Friedrich K.; Federmann, Helmut; Noack, Georg; and Kraus, Anton, 4,943,714, Cl. 250-227.160.

Femano, Philip A.; and Zanakis, Michael F., to Eclectica, Inc. Stereoscopic converter assembly for closed circuit 2-D television system. 4,943,852, Cl. 358-88.000.

Fenton, Hank: *See—*
Thomson, Kenneth L.; Fenton, Hank; and Tesch, Norbert, 4,943,035, Cl. 256-64.000.

Ferco International Usine de Ferrures de Batiment: *See—*
Simoncelli, Philippe, 4,942,694, Cl. 49-192.000.

Ferguson, John H.: *See—*
Snyder, Robert F.; and Ferguson, John H., 4,942,794, Cl. 81-57.220.

Ferree, Herbert E.; and Revelj, Ellen J., to Space Industries Partnership, L.P. Apparatus and method for removing and replacing a feedthrough connector in a pressurized spacecraft hull. 4,942,793, Cl. 81-54.000.

Ferro, Gregory A., to Imi-Tech Corporation. Recurable and cured cellular materials. 4,943,598, Cl. 521-184.000.

Ferro, Gregory A., to Imi-Tech Corporation. Recurable and cured cellular materials. 4,943,599, Cl. 521-184.000.

Fiard, Jean-Francois: *See—*
Charmot, Dominique; and Fiard, Jean-Francois, 4,943,482, Cl. 428-407.000.

Fiat, Anne-Marie: *See—*
Jolles, Pierre; Fiat, Anne-Marie; Soria, Claudine; Levy-Toledano Sylviane; Raha, Sanghamitra; Mazoyer, Elisabeth; and Drouet, Ludovic, 4,943,562, Cl. 514-18.000.

Field, John R.: *See—*
Flesher, Peter; Farrar, David; and Field, John R., 4,943,378, Cl. 210-734.000.

Field, Lamar; Musallam, Hikmat A.; Macke, Jeffrey D.; and Srivastava, Pramod K., to Vanderbilt University. Unsymmetrical organic disulfide compounds useful as antiradiation agents. 4,943,657, Cl. 562-125.000.

Fienberg, Debra, to Douglas Press, Inc. Lottery-type gaming apparatus. 4,943,090, Cl. 273-139.000.

Fiet, Zeev; Kostyk, Douglas; and Woods, Robert J., to Spectra-Physics, Inc. Low tuning rate single mode PbTe/PbEuSeTe buried heterostructure tunable diode lasers and arrays. 4,943,971, Cl. 372-46.000.

Fife, Morton E. Device for cyclically varying the phase relationship between two rotating shafts. 4,942,777, Cl. 74-397.000.

Fifth Dimension, Inc.: *See—*
Bitko, Sheldon S., 4,943,690, Cl. 200-61.470.

Fildan, Gerhard. Hanger for small packages. 4,943,026, Cl. 248-339.000.

Fillon, Jacques: *See—*
Courtois, Michel; and Fillon, Jacques, 4,942,718, Cl. 53-435.000.

Finch, Harry: *See—*
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; and Campbell, Ian B., 4,943,591, Cl. 514-539.000.

Fini, Carlo, to A. Testoni S.p.A. Method for manufacturing ties from interwoven harp and weft tapes. 4,943,329, Cl. 156-88.000.

Finke, Harry P., to Bloom Engineering Company, Inc. Method and device for controlling NOx emissions by vitiation. 4,942,832, Cl. 110-190.000.

Finlan, Martin F.: *See—*
Wilson, Martin N.; and Finlan, Martin F., 4,943,781, Cl. 328-234.000.

Finn, Peter J.: *See—*
Powers, Stephen R.; Finn, Peter J.; and Fisher, Michael G., 4,943,517, Cl. 430-301.000.

Finstad, Clem B.; and Fredrickson, Howard J., to Cannon Equipment Company. Adjustable work stand. 4,943,040, Cl. 269-69.000.

First Eastern Equities, Inc.: *See—*
Kramer, Karl H., 4,943,684, Cl. 428-34.400.

Fischer, Artur, to Fischerwerke Artur Fischer GmbH & Co. KG. Expansible anchoring plug assembly. 4,943,195, Cl. 411-55.000.

Fischer, Frank E.; and Kelly, Shayne A. Glove dispenser. 4,942,992, Cl. 224-240.000.

Fischer Gesellschaft m.b.H.: *See—*
Fischer, Josef, 4,943,030, Cl. 249-121.000.

Fischer, Josef, to Fischer Gesellschaft m.b.H. Ski. 4,943,030, Cl. 249-121.000.

Fischer, Ronald H.; LaPierre, Rene B.; Owens, Peter J.; and Varghese, Philip, to Mobil Oil Corporation. Production of high octane gasoline. 4,943,366, Cl. 208-68.000.

Fischerwerke Artur Fischer GmbH & Co. KG: *See—*
Fischer, Artur, 4,943,195, Cl. 411-55.000.

Fisher, Michael G.: *See—*
Powers, Stephen R.; Finn, Peter J.; and Fisher, Michael G., 4,943,517, Cl. 430-301.000.

Fisher, Richard A.: *See—*
Gilbert, Walter; Fisher, Richard A.; Sato, Vicki L.; and Leban, Johann J., 4,943,627, Cl. 530-324.000.

Fitzner, Werner: *See—*
Diekhans, Norbert; Fitzner, Werner; and Ostrup, Heinrich, 4,942,724, Cl. 56-10.400.

Fitzpatrick, Leo F.: *See—*
Su, Sophia R.; and Fitzpatrick, Leo F., 4,943,425, Cl. 423-338.000.

Flaherty, Brian J., to Davey Roofing, Inc. Roofing safety device. 4,942,943, Cl. 182-231.000.

Fleckenstein, Allen E., to CX Corporation. Photographic print cutter. 4,943,270, Cl. 493-10.000.

Fleissner, Gerold, to Fleissner Machinenfabrik AG. Method for packing fibrous material into bales and a fiber bale press suitable therefor. 4,942,719, Cl. 53-436.000.

Fleissner Machinenfabrik AG: *See—*
Fleissner, Gerold, 4,942,719, Cl. 53-436.000.

Flemming, Udo; and Bauer, Willi, to PUMA Aktiengesellschaft Rudolf Dassler Sport. Shoe, especially sport shoe or shoe for medical purposes. 4,942,677, Cl. 36-27.000.

Flesher, Peter; Farrar, David; and Field, John R., to Allied Colloids Ltd. Flocculation processes. 4,943,378, Cl. 210-734.000.

Fletcher, Graham J.: *See—*
Laws, Peter G.; and Fletcher, Graham J., 4,943,788, Cl. 331-11.000.

Flexible Steel Lacing Company: *See—*
Musil, Edward C., 4,942,645, Cl. 24-33.00C.

Flint, Keith E.: *See—*
Holce, Thomas J.; and Flint, Keith E., 4,943,791, Cl. 335-153.000.

Floden, Mats. Method of refining fibrous material by controlling the feed rate of material or the gap distance between discs. 4,943,347, Cl. 162-61.000.

Floyd, Middleton B., Jr.: *See—*
DeVries, Vern G.; Claus, Thomas H.; Floyd, Middleton B., Jr.; and Ayral-Kaloustian, Semiramis, 4,943,629, Cl. 536-117.000.

Flynn, Daniel L.: *See—*
Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; and Sircar, Jagadish C., 4,943,587, Cl. 514-415.000.

FMC Corporation: *See—*
Feistehausen, Eugene F., 4,943,259, Cl. 460-52.000.

Focke & Co. (GmbH & Co.): *See—*
Focke, Heinz, 4,942,715, Cl. 53-202.000.
Focke, Heinz; and Liedtke, Kurt, 4,942,961, Cl. 206-254.000.
Focke, Heinz; and Liedtke, Kurt, 4,943,271, Cl. 493-24.000.

Focke, Heinz, to Focke & Co. (GmbH & Co.). Apparatus for the stabilization and drying of cuboid packs. 4,942,715, Cl. 53-202.000.

Focke, Heinz; and Liedtke, Kurt, to Focke & Co. (GmbH & Co.). Cigarette pack, especially hinge-lid pack. 4,942,961, Cl. 206-254.000.

Focke, Heinz; and Liedtke, Kurt, to Focke & Co. (GmbH & Co.). Apparatus for the production of (cigarette) packs. 4,943,271, Cl. 493-24.000.

Fogarty, Kevin E.: *See—*
Fay, Fredric S.; Fogarty, Kevin E.; and Rodgers, Cyril, 4,943,142, Cl. 350-315.000.

Foley, Charles F.: *See—*
Lathim, Delbert L.; Liu, Ting; and Foley, Charles F., 4,943,066, Cl. 273-415.000.

Foltz, Raymond A.: *See—*
McGuckin, James P.; Bradfield, Dean L.; Foltz, Raymond A.; and Heidt, H. James, 4,943,185, Cl. 405-45.000.

Ford Motor Company: *See—*
Baltusis, Paul A.; Greene, Thomas L.; and Palansky, Bruce J., 4,943,921, Cl. 364-424.100.
Schmitt, Holm; Henken, Fritz; Roper, Hartmut; and Heider, Peter, 4,943,265, Cl. 474-25.000.
Sinkunas, Peter J.; Ritter, Rodney L.; and Altpeter, James E., 4,942,997, Cl. 228-56.100.
Skrbina, John R.; Polityka, Gregory A.; and Smith, Mark L., 4,943,109, Cl. 296-146.000.
Soltis, Richard E.; Logothetis, Eleftherios M.; and Aslam, Mohammad, 4,943,558, Cl. 505-1.000.

Fore, Don C. Cable pair tester. 4,943,993, Cl. 379-6.000.

Forman, Glenn A.: *See—*
Jacob, Philippe L.; Noujaim, Sharbel E.; Forman, Glenn A.; and Mallick, John A., 4,943,888, Cl. 361-96.000.

Forman, Ralph: *See—*
Bardai, Zaher; Rolph, Randy K.; Lamb, Arlene E.; Longo, Robert T.; Manoly, Arthur E.; and Forman, Ralph, 4,943,343, Cl. 156-643.000.

Forster, Arno; Oberholz, Gerhard; and Romuss, Christiane, to Aktiengesellschaft Kuehnle, Kopp & Kausch. Internal axis rotary piston machine with meshing engagement between outer and inner rotors. 4,943,213, Cl. 417-310.000.

Fortuna-Werke Maschinenfabrik GmbH: *See—*
Wedeniwski, Horst J., 4,942,695, Cl. 51-165.00R.

Fossum, Arthur J. Weed seed harvester. 4,943,260, Cl. 460-96.000.

Foster, Danny S.: *See—*
Brodersen, Cole T.; and Foster, Danny S., 4,943,037, Cl. 267-131.000.

Fourne, Franz, to Fourne Maschinenbau GmbH. Apparatus for cooling melt spun filament bundles. 4,943,220, Cl. 425-66.000.

Fourne Maschinenbau GmbH: *See—*
Fourne, Franz, 4,943,220, Cl. 425-66.000.

Fournier, Jerald C., to Axle-Tru, Inc. Portable axle and frame alignment tool. 4,942,667, Cl. 33-288.000.

Foux, Amnon, to National Research Council of Canada. Plate for broken bone fixation. 4,943,292, Cl. 606-70.000.

Fox, David A.; and Billings, William W., to Westinghouse Electric Corp. Current limited DC power controller. 4,943,761, Cl. 323-283.000.

Fox Valley Systems, Inc.: *See—*
Smrt, Thomas J., 4,943,008, Cl. 239-754.000.

Fraher, Daniel. Ash container. 4,943,002, Cl. 232-43.100.

Framatome: *See—*
Bourdonne, Jean-Claude; and Briand, Alain, 4,942,660, Cl. 29-701.000.

Franck, Jean-Pierre: *See—*
Travers, Christine; and Franck, Jean-Pierre, 4,943,546, Cl. 502-66.000.

Franke, Helga: *See—*
Angermann, Alfred; Franke, Helga; and Johann, Gerhard, 4,943,310, Cl. 71-88.000.

Frankeny, Richard F.; Haj-ali-Ahmadi, Javad; Imken, Ronald L.; and Wustrau, Rolf, to International Business Machines Corporation. Zero

insertion force high density connector system. 4,943,242, Cl. 439-65.000.
Franklin, Robert C., to Zircon International, Inc. Digital inclinometer. 4,942,668, Cl. 33-366.000.
Fredrickson, Howard J.: *See*—
Finstad, Clem B.; and Fredrickson, Howard J., 4,943,040, Cl. 269-69.000.
Frens, Gerrit: *See*—
Van Beek, Johann R. G. C. M.; and Frens, Gerrit, 4,943,500, Cl. 429-207.000.
Freund, Paul X., to Mine Safety Appliances Company. Helmet suspension having ratchet adjustment. 4,942,628, Cl. 2-416.000.
Frey, Gary A.; and Lengel, James D., to Allied-Signal Inc. Screw pump for lubricating generator bearing. 4,942,944, Cl. 184-27.100.
Freyne, Eddy J. E.: *See*—
Raeymaekers, Alfons H. M.; Freyne, Eddy J. E.; Van Gelder, Josephu L. H.; and Venet, Marc G., 4,943,574, Cl. 514-338.000.
Friesen, Peter. Rotational moulding machine. 4,943,221, Cl. 425-73.000.
Frigerio, Marco: *See*—
Nisato, Dino; and Frigerio, Marco, 4,943,641, Cl. 548-953.000.
Fuchs, Francis J., Jr., to Rhodes, R. Gale, Jr., a part interest. Process and apparatus for forming internally enhanced tubing. 4,942,751, Cl. 72-68.000.
Fuji Electric Co., Ltd.: *See*—
Yamashita, Seisuke, 4,943,143, Cl. 350-339.00R.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Morikawa, Koji, 4,942,859, Cl. 123-198.00D.
Morimoto, Yoshihiko, 4,942,783, Cl. 74-866.000.
Muto, Naoto, 4,942,855, Cl. 123-90.330.
Fuji Photo Film Co., Ltd.: *See*—
Adachi, Yuuma; and Nakajima, Nobuyoshi, 4,943,723, Cl. 250-327.200.
Arakawa, Satoshi; Takahashi, Kenji; and Hosoi, Yuichi, 4,944,026, Cl. 250-484.100.
Horikawa, Hiroshi; Urabe, Hitoshi; and Yako, Katsutoshi, 4,943,869, Cl. 358-426.000.
Kitada, Akira; Yamazaki, Kikuo; Matsuda, Terumi; and Kawagoe, Jun, 4,943,727, Cl. 250-483.100.
Miyagawa, Ichirou, 4,943,871, Cl. 358-496.000.
Okazaki, Masaki; Yabe, Masao; and Kawatta, Ken, 4,943,515, Cl. 430-270.000.
Ono, Shuji; and Kimura, Tsutomu, 4,943,725, Cl. 250-327.200.
Saotome, Shigeru; and Ishida, Masamitsu, 4,943,724, Cl. 250-327.200.
Uchiyama, Kaoru; and Ishizuka, Tetuya, 4,943,823, Cl. 354-322.000.
Yamada, Yasuyuki; Nagao, Matoko; and Morita, Kazuhiko, 4,943,479, Cl. 428-331.000.
Yoneyama, Masakazu; and Mukunoki, Yasuo, 4,943,520, Cl. 430-527.000.
Fuji Xerox Co., Ltd.: *See*—
Aoki, Takayoshi; Ishii, Yukihiro; Tanaka, Koichi; and Sadamatsu, Shigeru, 4,943,505, Cl. 430-109.000.
Fujii, Katsunori: *See*—
Sasaki, Kenji; Matsushita, Mitsuo; Ono, Kenzo; Horiwaki, Akihiro; Fujii, Katsunori; and Hatano, Hiroyuki, 4,943,829, Cl. 355-215.000.
Fujimoto, Yoshiji: *See*—
Morio, Tomokazu; Fujimoto, Yoshiji; and Kitoh, Atsunori, 4,944,012, Cl. 381-30.000.
Fujino, Tomizo: *See*—
Seino, Shuichi; and Fujino, Tomizo, 4,943,637, Cl. 548-260.000.
Fujioka, Kazutoshi: *See*—
Arai, Masatoshi; Fujioka, Kazutoshi; and Satou, Masaharu, 4,943,613, Cl. 524-773.000.
Fujisaki, Koichiro; Obashi, Ryota; and Nemoto, Shusuke, to Kanzaki Kokyukoki Mfg., Co., Ltd. HST(hydrostatic transmission) housing axle driving apparatus. 4,942,780, Cl. 475-83.000.
Fujisawa, Toru: *See*—
Takehara, Sadao; Fujisawa, Toru; Arai, Yoshi; and Kurokawa, Jitsuo, 4,943,386, Cl. 252-299.650.
Fujita, Kenjiro: *See*—
Hiramatsu, Takeo; Ozaki, Tetsuo; and Fujita, Kenjiro, 4,943,920, Cl. 364-424.100.
Fujita, Shigekiyo; Kurushima, Toyokazu; Kuno, Hiroaki; and Hiraiwa, Hiromitsu, to Inax Corporation; and Fujita, Shigekiyo. Cerebral aneurysm clip. 4,943,298, Cl. 606-158.000.
Fujitsu Limited: *See*—
Fukushima, Toshitaka, 4,943,742, Cl. 307-458.000.
Fujiwara, Michiaki: *See*—
Morihashi, Toshifumi; Sakai, Shoji; Nakayama, Teruo; Noda, Koshi; and Fujiwara, Michiaki, 4,942,731, Cl. 57-328.000.
Fukada, Takeshi: *See*—
Sakama, Mitsunori; Fukada, Takeshi; Sakamoto, Naoya; Amachi, Nobumitsu; Hayashi, Shigenori; and Inushima, Takashi, 4,943,710, Cl. 250-208.100.
Fukinuki, Takahiko, to Hitachi, Ltd. Television signal transmission system. 4,943,848, Cl. 358-12.000.
Fukunaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Hano, Sunao; and Satoh, Masaharu, to Nissan Motor Company, Limited. Actively controlled suspension system for suppressing attitude change of vehicular body. 4,943,084, Cl. 280-707.000.
Fukuo, Koichi: *See*—
Shirai, Hiroshi; Tatsumi, Takashi; Kanda, Hisashi; Fukuo, Koichi; Motsumoto, Masahiko; and Hiro, Toshiaki, 4,942,854, Cl. 123-90.170.
Fukushima, Naoto: *See*—
Fukunaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Hano, Sunao; and Satoh, Masaharu, 4,943,084, Cl. 280-707.000.
Fukushima, Shigenobu, to Minolta Camera Kabushiki Kaisha. Color copying apparatus and method. 4,943,833, Cl. 355-326.000.
Fukushima, Shoji: *See*—
Nakano, Masahiro; Fukushima, Shoji; Kawaguchi, Takeo; and Suzuki, Yoshiki, 4,943,564, Cl. 514-50.000.
Fukushima, Toshitaka, to Fujitsu Limited. Schottky barrier diode clamp transistor. 4,943,742, Cl. 307-458.000.
Fukuyama, Masao: *See*—
Tsuchiya, Sohji; Kudoh, Yasuo; Kojima, Toshikuni; Fukuyama, Masao; and Yoshimura, Susumu, 4,943,892, Cl. 361-525.000.
Fullington, Michael C.: *See*—
Pennington, B. Timothy; and Fullington, Michael C., 4,943,643, Cl. 549-532.000.
Funakubo, Hiroyasu; Dohi, Takeyoshi; Sakuma, Ichiro; and Komeda, Takashi, to Life Technology Research Foundation. Robot for surgical operation. 4,943,296, Cl. 606-166.000.
Funo, Yasuo: *See*—
Yamamoto, Fumiaki; Otsuka, Tsutomu; and Funo, Yasuo, 4,943,408, Cl. 376-210.000.
Furukawa Electric Co., Ltd., The: *See*—
Ozawa, Kazuhiro; Nakajima, Etsuo; and Yamaguchi, Isao, 4,943,326, Cl. 148-11.50N.
Furukawa, Kenji; and Terashima, Kanetsugu, to Chisso Corporation; and Hitachi, Ltd. Chiral smectic liquid crystal composition. 4,943,387, Cl. 252-299.670.
Furukawa, Michiaki: *See*—
Okinaga, Takayuki; Tachi, Hiroshi; Ozaki, Hiroshi; Otsuka, Kanji; Furukawa, Michiaki; and Yamasaki, Yasuyuki, 4,943,843, Cl. 357-70.000.
Fuschetto, Anthony N., to United States of America, Air Force. Differential eddy current sensor measuring apparatus for use with movable mirror segments. 4,943,771, Cl. 324-207.180.
Fuse, Tsuneaki: *See*—
Sakui, Koji; Fuse, Tsuneaki; and Masuoka, Fujio, 4,943,944, Cl. 365-189.050.
Fushiki, Yasuo: *See*—
Tsunemi, Hidenari; Fushiki, Yasuo; Nishimura, Asaichi; and Kawai, Yousuke, 4,943,474, Cl. 428-246.000.
Futch, Laurence E., Jr.: *See*—
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; Deal, James F., III; and Bolden, Paul L., Jr., 4,943,390, Cl. 252-355.000.
G. D. Societa Per Azioni: *See*—
Mattei, Riccardo, 4,943,341, Cl. 156-517.000.
G. T. Norton, Inc.: *See*—
Nesser, Thomas A.; Nesser, Deborah L.; Luckower, Herbert; Barczak, John P.; Joslyn, Edward P.; and Rick, Bernard J., 4,942,954, Cl. 194-351.000.
Gabriel, Edwin Z. Tongs-like cargo hook device with automatic loading and unloading capability. 4,943,099, Cl. 294-82.320.
GAF Chemicals Corporation: *See*—
Anderson, Lowell R.; Hashem, Mohamed M.; and Login, Robert B., 4,943,664, Cl. 568-623.000.
Gaffney, Thomas R.: *See*—
Coe, Charles G.; and Gaffney, Thomas R., 4,943,304, Cl. 55-66.000.
Gaidis, James M.: *See*—
Gartner, Ellis M.; Myers, David F.; and Gaidis, James M., 4,943,323, Cl. 106-808.000.
Gakhar, Ved P.; Dossett, Richard A.; and McCord, Wilfred M., Jr., to Vermont American Corporation. Router attachment. 4,942,912, Cl. 144-136.00C.
Gall, Klaus P.: *See*—
Schlamp, Guenther; Gall, Klaus P.; Langer, Adolf; and Ptaschek, Georg, 4,943,362, Cl. 204-298.130.
Gallacher, Lawrence V.; and Condos, Harry N., to King Industries, Inc. Process for the production of polyalkylaromatic polysulfonic acids and recovery by heavy phase separation. 4,943,656, Cl. 562-90.000.
Galloway, Donald. Tilting mobile platform. 4,943,202, Cl. 414-475.000.
Gambale, Michael: *See*—
Linkow, Leonard I.; Rinaldi, Anthony W.; and Gambale, Michael, 4,943,236, Cl. 433-165.000.
Gannett Co., Inc.: *See*—
Valia, Johnnie J., 4,943,695, Cl. 200-345.000.
Gardner, Elmer W., Jr. Electrohydraulic/air bike. 4,942,936, Cl. 180-207.000.
Garrett, James E.: *See*—
Masters, Timothy E.; Lucas, Paul B.; Garrett, James E.; and Carstedt, John K., 4,943,806, Cl. 341-31.000.
Garrett, Robert T.: *See*—
Brandon, Michael D.; Dorris, Robert A.; Garrett, Robert T.; Helton, Roy N.; Roney, Don G.; and Vinson, James R., 4,942,679, Cl. 36-102.000.
Gartner, Ellis M.; Myers, David F.; and Gaidis, James M., to W. R. Grace & Co.-Conn. Processing additives for blended cements. 4,943,323, Cl. 106-808.000.
Gartner, Klaus. Lighting fixture. 4,943,900, Cl. 362-227.000.
Garzon-Aburbeh, Aaron: *See*—
Vishnuvajjala, B. Rao; and Garzon-Aburbeh, Aaron, 4,943,579, Cl. 514-283.000.
Gasser, Neal G.: *See*—
Seamans, James D.; Welch, James G.; and Gasser, Neal G., 4,943,547, Cl. 502-150.000.

Gates, Patrick G. Pair of wheeled skate-skis with brakes usable on most terrains. 4,943,075, Cl. 280-842.000.

Gatsis, John G., to UOP. Method of preparing a catalyst for the hydroconversion of asphaltene-containing hydrocarbonaceous charge stocks. 4,943,548, Cl. 502-173.000.

Gausepohl, Hermann: *See*—
Taubitz, Christof; Gausepohl, Hermann; Seiler, Erhard; Boehlke, Klaus; and Schlemmer, Lothar, 4,943,399, Cl. 264-101.000.

Gauthier, Maurice, to Asten Group, Inc. Procedure to form a non-woven cloth made of synthetic filaments. 4,943,327, Cl. 156-62.600.

Gebr. Eickhoff Maschinenfabrik u. EisengieBerei: *See*—
Groger, Hans, 4,943,120, Cl. 299-42.000.

Gebr. Happich GmbH: *See*—
Dietz, Gunter; Dabringhaus, Volker; and Wegel, Peter, 4,943,124, Cl. 312-222.000.
Schroder, Franz; and Strutz, Gerd, 4,943,335, Cl. 156-244.180.

GEC Alsthom SA: *See*—
Dupraz, Jean-Pierre; and Moncorge, Jean-Paul, 4,943,765, Cl. 324-107.000.

Geddes, Norman K.: *See*—
Clark, Jack; and Geddes, Norman K., 4,943,006, Cl. 238-349.000.

Geerts, Jean-Pierre: *See*—
Gobert, Jean; Geerts, Jean-Pierre; and Bodson, Guy, 4,943,639, Cl. 548-550.000.

Geeting, Marvin D. Apparatus for isolating a testing zone in a bore hole screen casing. 4,942,923, Cl. 166-250.000.

Gehring, Mark R.; Suter, Richard R.; and Ragan, Lawrence H., to AT&E Corporation. Direct conversion FM receiver with offset. 4,944,025, Cl. 455-207.000.

Geisen, Karl: *See*—
Glombik, Heiner; Utz, Roland; Lang, Hans-Jochen; Geisen, Karl; and Beyhl, Friedrich E., 4,943,576, Cl. 514-249.000.

Gelbard, Edward, to Hilex Poly Company, Inc. Plastic bag and method and apparatus of manufacture. 4,943,167, Cl. 383-8.000.

Gelphman, Janet L.; and Mottweiler, Kurt R., to Gelphman, Janet Louise. Topological panorama camera. 4,943,821, Cl. 354-99.000.

Gelphman, Janet Louise: *See*—
Gelphman, Janet L.; and Mottweiler, Kurt R., 4,943,821, Cl. 354-99.000.

General Atomics: *See*—
Breneman, Bruce C.; Parker, J. Wesley; and Sarwinski, Raymond E., 4,943,774, Cl. 324-318.000.

General Dynamics Corporation, Electronics Division: *See*—
Bradley, Eric M., 4,943,970, Cl. 372-45.000.

General Electric Company: *See*—
Baldwin, Samuel L.; and Osteen, Mitchell M., 4,943,901, Cl. 362-277.000.
Dinallo, Anthony J., Sr., 4,943,601, Cl. 524-265.000.
Gross, David C.; Haig, Connie L.; and Rich, Jonathan D., 4,943,596, Cl. 521-82.000.
Jacob, Philippe L.; Noujaim, Sharbel E.; Forman, Glenn A.; and Mallick, John A., 4,943,888, Cl. 361-96.000.
Lounsberry, Brian D.; and Truszkowska, Krystyna, 4,943,989, Cl. 378-130.000.
Ngo, Khai D. T.; and Charles, Richard J., 4,943,793, Cl. 336-83.000.
Nied, Herman F.; and Inzinna, Louis P., 4,943,224, Cl. 425-174.80R.
Srivastava, Vishnu C.; and Wollan, John J., 4,943,792, Cl. 335-216.000.
Taub, Alan I.; Lee, Minyoung; and Hibbs, Louis E., Jr., 4,942,798, Cl. 83-636.000.

General Engineering (Netherlands) B.V.: *See*—
Karlsson, Leif E., 4,943,240, Cl. 439-15.000.

General Mills, Inc.: *See*—
Armstrong, Glenn S., 4,943,440, Cl. 426-118.000.

General Motors Corporation: *See*—
Brandenburg, Darrell L., 4,943,895, Cl. 362-66.000.
Wright, William D.; and Snyder, George K., 4,942,654, Cl. 29-890.035.

Genesco, Inc.: *See*—
Brandon, Michael D.; Dorris, Robert A.; Garrett, Robert T.; Helton, Roy N.; Roney, Don G.; and Vinson, James R., 4,942,679, Cl. 36-102.000.

Geok, Anna T. K.: *See*—
Teck, Yap Y.; Wah, Lim T.; Geok, Anna T. K.; and Weng, Chan H., 4,943,244, Cl. 439-567.000.

Georg Fischer AG: *See*—
Henych, Ivo; and Pavlovsky, Rudolf, 4,943,411, Cl. 423-566.000.

Georgia Kaolin Company, Inc.: *See*—
Bundy, Wayne M.; Manasso, John A.; and Berberich, Joseph P., 4,943,324, Cl. 106-486.000.

Geostar Corporation: *See*—
Motamedi, Masoud, 4,943,974, Cl. 375-1.000.

Geraets, Jacques J. M.; Graswinckel, Julius V. C.; and van der Sterren, Martin L., to Oce-Nederland B.V. Fixing device for fixing a powder image on a receiving sheet. 4,943,831, Cl. 355-290.000.

Gerke, Burton E., Jr.; and Kosten, Richard B., to Black & Decker Inc. Accessory brush attachment. 4,942,641, Cl. 15-338.000.

Gerlach, Hans-Juergen; and Aichinger, Horst, to Siemens Aktiengesellschaft. X-ray diagnostics installation having an image intensifier video chain. 4,943,988, Cl. 378-108.000.

Gerstner-Stevens, Ditmar; and Schrod, Josef, to Karl Mayer Textilmaschinenfabrik GmbH. Plying or doubling machine. 4,943,009, Cl. 242-42.000.

Gervals, Christian: *See*—
Aviron-Violet, Paul; and Gervals, Christian, 4,943,679, Cl. 562-561.000.

Gessner & Co., GmbH: *See*—
Heininger, Hans-Ulrich; Munninger, Wilhelm; and Pawlowsky, Ernst, 4,943,374, Cl. 210-651.000.

Gevelber, Michael A.; and Patera, Anthony T., to Massachusetts Institute of Technology. Interface angle estimation system. 4,943,160, Cl. 356-372.000.

Geyer, Freddy; Henry, Jean P.; and Libert, Paul, to Aerospatiale Societe Nationale Industrielle. Fixing system enabling a structure to be rapidly docked for securing thereon an element in a detachable way. 4,943,015, Cl. 244-161.000.

Geyer, Harry J.: *See*—
Simmons, Marion I.; and Geyer, Harry J., 4,943,708, Cl. 235-492.000.

Ghedina, Dino. Device for the discharge of intestinal gases. 4,943,276, Cl. 600-29.000.

Gherardi, Bernard, to Societe Anonyme dite Alcatel CIT. Frame synchronization device for a synchronous digital bit stream divided into blocks by means of a block code and structured in frames. 4,943,985, Cl. 375-111.000.

Ghiardo, Fiorenzo, to ROJ Electrotex S.p.A. Weft-feeder with automatic adjustment of the delay time, for weft feeders of shuttleless looms. 4,942,909, Cl. 139-370.200.

Gibellini, Folco, to Aies Gibellini S.p.A. Container for storage batteries. 4,942,963, Cl. 206-333.000.

Gilbert, Hugh H. Electrical connector for wire connection. 4,943,246, Cl. 439-656.000.

Gilbert, Stanley R.; and Weyand, Thomas E., to Pittsburgh Mineral & Environmental Technology, Inc. Nonmetallic abrasive blasting material recovery process including an electrostatic separation step. 4,943,368, Cl. 209-2.000.

Gilbert, Walter; Fisher, Richard A.; Sato, Vicki L.; and Leban, Johann J., to Biogen, Inc. Peptides involved in the pathogenesis of HIV infection. 4,943,627, Cl. 530-324.000.

Gilbert, Wendell L.: *See*—
Rabe, William T.; and Gilbert, Wendell L., 4,942,803, Cl. 91-370.000.

Gillette, Richard A. Random indicia selector. 4,943,062, Cl. 273-144.00B.

Ginn, William D. Seed collector device for a mower. 4,942,727, Cl. 56-126.000.

Giro, Gabriele: *See*—
Casalbore-Miceli, Giuseppe; Beggiato, Giancarlo; DiMarco, Pier G.; and Giro, Gabriele, 4,943,499, Cl. 429-192.000.

Girsberger Holding AG: *See*—
Stucki, Felix, 4,943,115, Cl. 297-301.000.

Gist-brocades NV: *See*—
Van den Berg, Johan A.; Van Ooyen, Albert J. J.; and Rietveld, Krijn, 4,943,529, Cl. 435-172.300.

Giunta, Richard F.; Becker, Robert D.; Schwartz, Martin J.; Coyle, Richard W.; and Curcuru, Kevin H., to Wang Laboratories, Inc. Memory diagnostic apparatus and method. 4,943,966, Cl. 371-11.100.

GKN Automotive, Inc.: *See*—
Hazebrook, Daniel W.; and Wagner, Jurgen, 4,942,652, Cl. 29-898.067.

GKN Cardantec International Gesellschaft fur Antriebstechnik mbH: *See*—
Schultze, Jurgen, 4,943,262, Cl. 464-131.000.

GKSS Forschungszentrum Geesthacht GmbH: *See*—
Michaelis, Walfried; and Weitkamp, Claus, 4,943,161, Cl. 356-437.000.

Glaser, Garry S.: *See*—
Glaser, Gary A.; and Glaser, Garry S., 4,943,018, Cl. 248-110.000.

Glaser, Gary A.; and Glaser, Garry S. Wall-mountable back brush. 4,943,018, Cl. 248-110.000.

Glaxo Group Limited: *See*—
Looker, Brian E., 4,943,631, Cl. 540-222.000.
Naylor, Alan; Judd, Duncan B.; and Brown, Dearg S., 4,943,578, Cl. 514-252.000.
Robinson, Colin, 4,943,632, Cl. 540-225.000.
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; and Campbell, Ian B., 4,943,591, Cl. 514-539.000.

Glombik, Heiner; Utz, Roland; Lang, Hans-Jochen; Geisen, Karl; and Beyhl, Friedrich E., to Hoechst Aktiengesellschaft. Substituted quinoxalyl-imidazolidine-2,4-diones, processes for their preparation, their use as medicaments and pharmaceutical preparations. 4,943,576, Cl. 514-249.000.

Gloton, Jean-Pierre; and Peres, Philippe, to SGS-Thomson Microelectronics SA. Electronic component support for memory card and product obtained thereby. 4,943,464, Cl. 428-76.000.

Gmohling, Werner: *See*—
Lischka, Helmut; Gmohling, Werner; and Hieber, Gerd, 4,943,317, Cl. 75-312.000.

Gobert, Jean; Geerts, Jean-Pierre; and Bodson, Guy, to U C B Societe Anonyme. (S)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide. 4,943,639, Cl. 548-550.000.

Goda, Hiroshi: *See*—
Kato, Kunioki; Kawamura, Masao; Goda, Hiroshi; Sawada, Kiyoshi; and Hamatani, Kazuhiro, 4,943,655, Cl. 562-46.000.

Godwin, Kurt E., to Colorado Memory Systems, Inc. Speed controller for recording and playback apparatus. 4,943,907, Cl. 364-200.000.

Goetz, Norbert: *See*—
Hoelderich, Wolfgang; Goetz, Norbert; and Hupfer, Leopold, 4,943,667, Cl. 568-814.000.

Goff, Stephen P.; Tanese, Naoko; and Roth, Monica J., to Columbia University in the City of New York, The Trustees of. Expression of enzymatically active reverse transcriptase. 4,943,531, Cl. 435-194.000.

Gogniat, Paul, to ETA SA Fabriques d'Ebauches. Watchcase support fashioned from a contoured strip. 4,942,755, Cl. 72-254.000.
Gold Stake: *See*—
Lang, Paul W.; and Gribshaw, Franklin C., 4,943,851, Cl. 358-87.000.
Golden Valley Microwave Foods Inc.: *See*—
Andreas, David W.; and Cox, David H., 4,943,439, Cl. 426-107.000.
Golemon, Valia S. Component feeding device for circuit board mounting apparatus. 4,943,342, Cl. 156-584.000.
Golladay, Steven D.; Hohn, Fritz J.; Hutson, David J.; Meisburger, William D.; and Rasch, Juergen, to International Business Machines Corporation. Apparatus and method for opens/shorts testing of capacitively coupled networks in substrates using electron beams. 4,943,769, Cl. 324-158.00R.
Golpe, William, to Rancho Industries, Inc. Vehicle suspension assembly. 4,943,081, Cl. 280-666.000.
Golsch, Rudolph A. Jr.: *See*—
Wolfberg, Robert L.; Golsch, Rudolph A. M.; and Howard, Frank C., 4,942,996, Cl. 227-136.000.
Gombault, Jacobus F., to HADWE B. V. Method and apparatus for combining a plurality of serially supplied sheets. 4,943,369, Cl. 209-583.000.
Gomez, Daniel, to Papeteries de Gascogne. Process for preparing a sheet material with improved on-machine retention. 4,943,349, Cl. 162-158.000.
Gomez, Pompeyo B., to Industrias John Deere, S.A. de C.V. Bidirectional moldboard plow with adjustable tilting mechanism. 4,942,928, Cl. 172-219.000.
Gomyo, Shiro; and Kobori, Takahide, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of a silicone-based pressure-sensitive adhesive. 4,943,620, Cl. 525-474.000.
Good, William G.; and Holycross, Mark E., to Mead Corporation, The. Method and apparatus for controlling exposure of an imaging sheet. 4,943,827, Cl. 355-30.000.
Goodall, Brian L.; Terlouw, Willem; and van der Sar, Jacob C., to Shell Oil Company. Preparation of conjugated dienes. 4,943,670, Cl. 585-601.000.
Goode, Louis; and Shipko, Frederick J., to Cook Pacemaker Corporation. Apparatus for removing an elongated structure implanted in biological tissue. 4,943,289, Cl. 606-1.000.
Goodes, Christopher G.: *See*—
Nixon, John C.; Eady, John A.; and Goodes, Christopher G., 4,943,367, Cl. 208-131.000.
Goodman, Ronald D., to Libbey-Owens-Ford Co. Solar control glass assembly and method of making same. 4,943,484, Cl. 428-441.000.
Goran, Fallman: *See*—
Tsviatko, Ganev; and Goran, Fallman, 4,943,371, Cl. 210-101.000.
Gordon, Robert J.; Love, Brian J.; Peterson, Robert K.; and Ozmat, Burhan, to Texas Instruments Incorporated. Ceramic based substrate for electronic circuit system modules. 4,943,468, Cl. 428-210.000.
Gordon, Stuart G., to University of Colorado Foundation, Inc., The. Enzyme immunoassay for cancer procoagulant. 4,943,524, Cl. 435-7.000.
Gortowski, Edmund P., to Conoco Inc. Method and apparatus for monitoring material in a liquid. 4,943,370, Cl. 210-85.000.
Gosc, Paul M.: *See*—
Citta, Richard W.; Gosc, Paul M.; Mutzabaugh, Dennis M.; and Sgrigonoli, Gary J., 4,944,006, Cl. 380-20.000.
Goto, Yukihisa; Masamoto, Kazuhisa; Yagihara, Hiroshi; Morishima, Yasuo; and Osabe, Hirokazu, to Daicel Chemical Industries, Ltd. Pyridine-3-carboxamide derivatives having plant growth inhibiting activity. 4,943,314, Cl. 71-94.000.
Gotoh, Nobuo: *See*—
Takemura, Hitoshi; Gotoh, Nobuo; and Isobe, Moriyuki, 4,943,730, Cl. 250-492.300.
Gotthardt, Gerhard R., to Telectronics, N.V. Pacemaker terminal apparatus. 4,942,876, Cl. 128-419.00P.
Goudy, Paul R., Jr.: *See*—
Van Antwerp, William P.; Steinmetz, Mark G.; and Goudy, Paul R., Jr., 4,943,357, Cl. 204-157.150.
Gouvianakis, Nikolaos; and Xydeas, Costas, to British Telecommunications Public Limited Company. Multi-pulse speech coder. 4,944,013, Cl. 381-38.000.
Govan, Donald T. Line cutter for propellers. 4,943,249, Cl. 440-73.000.
Grabel, Irwin J., to Williams Electronics Games, Inc. Multi-position drop target. 4,943,061, Cl. 273-127.00R.
Graco Inc.: *See*—
Vork, William D.; and Larson, James H., 4,942,899, Cl. 137-454.500.
Graham, Charles R.: *See*—
Coleman, James P.; Graham, Charles R.; and Monzyk, Bruce F., 4,943,646, Cl. 556-1.000.
Graham, Peter: *See*—
Cognasse, Christian; Graham, Peter; Maury, Bernard; and Walter, Jean-Claude, 4,944,017, Cl. 381-79.000.
Graswinckel, Julius V. C.: *See*—
Geraets, Jacques J. M.; Graswinckel, Julius V. C.; and van der Sterren, Martin L., 4,943,831, Cl. 355-290.000.
Green Cross Corporation, The: *See*—
Scherer, Kirby V., Jr.; Yamanouchi, Kouichi; Yokoyama, Kazumasa; and Naito, Ryoichi, deceased, 4,943,595, Cl. 514-722.000.
Green, Stephen L.: *See*—
Stern, Joseph A.; Green, Stephen L.; King, Charles B.; and May, Sharon B., 4,942,626, Cl. 2-161.00R.
Green, Thomas J., Jr.: *See*—
Pedersen, Peder C.; and Green, Thomas J., Jr., 4,943,779, Cl. 328-14.000.
Greene, Thomas L.: *See*—
Baltusis, Paul A.; Greene, Thomas L.; and Palansky, Bruce J., 4,943,921, Cl. 364-424.100.
Greenwood, John C.; and Naden, James M., to STC PLC. Transducer. 4,942,766, Cl. 73-704.000.
Greer, Larry J.; and Sexton, Robert A., to Allied Gear and Machine Company. Meter roll mounting means. 4,942,815, Cl. 101-352.000.
Gregorio, Frank, to Interplex Electronics, Inc. Automotive electronic instructional and diagnostic training apparatus. 4,943,238, Cl. 434-224.000.
Gregory, Charles. Hot gas defrost system for refrigeration systems. 4,942,743, Cl. 62-503.000.
Gribshaw, Franklin C.: *See*—
Lang, Paul W.; and Gribshaw, Franklin C., 4,943,851, Cl. 358-87.000.
Griffith, George L.: *See*—
Weete, John D.; and Griffith, George L., 4,943,389, Cl. 252-308.000.
Griffiths, John: *See*—
Rauscher, Elli; Griffiths, John; and Dixon, Leonard F., 4,943,526, Cl. 435-15.000.
Grigo, Ulrich: *See*—
Terrell, David R.; Monbaliu, Marcel J.; Grigo, Ulrich; and Berg, Klaus, 4,943,502, Cl. 430-58.000.
Grinberg, Jan; O'Meara, Thomas R., Jr.; and Welkowsky, Murray S., to Hughes Aircraft Company. Liquid crystal adaptive optics system. 4,943,709, Cl. 250-201.900.
Groger, Hans, to Gebr. Eickhoff Maschinenfabrik u. EisengieBerei. Force transmitting housing for longwall mining machine. 4,943,120, Cl. 299-42.000.
Grollimund, Everett C., to Philip Morris Incorporated. Expanded web of sheet material and method of making same. 4,942,889, Cl. 131-365.000.
Gropp, Heiko-Ulrich: *See*—
Reymann, Wolfgang; Gropp, Heiko-Ulrich; Vogel, Klaus; and Muller, Hartwig, 4,943,228, Cl. 425-526.000.
Reymann, Wolfgang; Gropp, Heiko-Ulrich; Vogel, Klaus; Muller, Hartwig; and Wiedenfeld, Walter, 4,943,229, Cl. 425-535.000.
Grosmann, Klaus: *See*—
Schulz, Guenter; Schubert, Juergen; Sauter, Hubert; Grosmann, Klaus; and Jung, Johann, 4,943,315, Cl. 71-120.000.
Gross, David C.; Haig, Connie L.; and Rich, Jonathan D., to General Electric Company. High strength silicone foam, and methods for making. 4,943,596, Cl. 521-82.000.
Groves, Gary W.; and Perry, David L., to Monroe Auto Equipment Company. Signal conditioning circuit assembly. 4,943,083, Cl. 280-707.000.
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Mohsen, Amr M.; Hamdy, Esmat Z.; and McCullum, John L., 4,943,538, Cl. 437-52.000.

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Baritz, Leonard, 4,943,197, Cl. 411-375.000.

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Kikuchi, Makoto; and Harada, Manabu, 4,943,416, Cl. 422-63.000.

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Okazaki, Yoji; Nitta, Yukami; and Harada, Shigeyoshi, 4,943,173, Cl. 400-689.000.

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Hellermann, Eberhard; and Welsch, Hans-Jurgen, 4,942,980, Cl. 221-244.000.

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Hartlaub, Thaddeus J.; Hartlaub, Mark T.; and Hartlaub, Paul P., 4,943,295, Cl. 606-131.000.

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Anderson, Lowell R.; Hashem, Mohamed M.; and Login, Robert B., 4,943,664, Cl. 568-623.000.

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Nakamura, Takao, 4,943,122, Cl. 301-108.00A.

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McGuckin, James P.; Bradfield, Dean L.; Foltz, Raymond A.; and Heidt, H. James, 4,943,185, Cl. 405-45.000.

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Heim, Otto, to A.W. Faber-Castell GmbH & Co. Feed mechanism for a writing device. 4,943,175, Cl. 401-111.000.

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Hektner, Thomas R.: *See*—
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Helm, Kurt, to Hako-Werke GmbH & Co. Hand-guided, mobile cleaning machine. 4,942,638, Cl. 15-50.00R.

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Buecheler, Herbert, 4,943,458, Cl. 428-35.700.
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Hentges, Judith L. Staircase amusement slide. 4,943,048, Cl. 272-56.50R.

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Herbet, Abel, to BTR Industrial Holdings, Ltd. Hopper assemblies. 4,942,911, Cl. 141-359.000.

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Hillen, Gerhard, to Starrfrasmaschinen AG. Machine tool storage apparatus. 4,943,199, Cl. 414-331.000.
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Kanegae, Hidetoshi; Tomikashi, Minoru; Hino, Akira; and Ueno, Takashi, 4,943,924, Cl. 364-431.120.
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Okamoto, Kaizo; Ichihara, Akira; Sato, Akimune; Hirata, Kenji; Hirayama, Katsuhisa; Hina, Eiji; Nakaji, Shigeru; Sakamoto, Minoru; Tanaka, Takashi; and Shimizu, Keizo, 4,942,773, Cl. 73-864.450.
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Shirai, Hiroshi; Tatsumi, Takashi; Kanda, Hisashi; Fukuo, Koichi; Motsumoto, Masahiko; and Hiro, Toshiaki, 4,942,854, Cl. 123-90.170.
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Toma, Hitoshi; Hisamura, Masafumi; and Tanaka, Shigemori, 4,943,819, Cl. 346-160.100.
Hisgen, Bernd: *See*—
Etzbach, Karl-Heinz; and Hisgen, Bernd, 4,943,617, Cl. 525-329.900.
Hishiki, Yuji, to Seiko Instruments Inc. Semiconductor integrated circuit for a telephone dialer including a wait-pause circuit. 4,944,000, Cl. 379-359.000.
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Hayashi, Fusashi; Takei, Kooichi; Matii, Yooichi; Simazaki, Toshikatsu; Imai, Akihito; and Nakada, Takao, 4,943,542, Cl. 501-12.000.
Hitachi Computer Engineering Co., Ltd.: *See*—
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Hitachi Construction Machinery Co., Ltd.: *See*—
Nozawa, Yusaku; Yuasa, Kazumasa; Ootu, Wataru; and Takahashi, Kinya, 4,942,900, Cl. 137-490.000.
Tatsumi, Akira, 4,942,737, Cl. 60-431.000.
Hitachi Koki Co., Ltd.: *See*—
Ainoya, Masayuki, 4,943,863, Cl. 355-271.000.
Hitachi, Ltd.: *See*—
Ando, Kimiaki; Ooyama, Mitsuo; and Saitou, Norio, 4,943,729, Cl. 250-492.300.
Aoshima, Toshihisa; Kanema, Seiichi; and Kato, Takeshi, 4,943,938, Cl. 364-522.000.
Aoyama, Tomoo; and Murayama, Hiroshi, 4,943,912, Cl. 364-200.000.
Fukinuki, Takahiko, 4,943,848, Cl. 358-12.000.
Furukawa, Kenji; and Terashima, Kasetsugu, 4,943,387, Cl. 252-299.670.
Hatanaka, Yuji; Okamoto, Hiroo; Wakumura, Shin-ichi; Miyake, Ichiro; and Sakamoto, Shunichiro, 4,943,964, Cl. 371-31.000.
Hirai, Kenshi; Murakami, Hiromichi; and Hatazawa, Kikuo, 4,943,936, Cl. 364-519.000.
Hirai, Ryoji; Yoshizawa, Mitsuru; and Ikeda, Hiroyuki, 4,943,754, Cl. 313-477.00R.
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Izuno, Nobuaki; Kurosu, Yasuo; Okazawa, Koichi; Yokoyama, Yoshihiro; and Ooyu, Kensuke, 4,943,857, Cl. 358-148.000.
Kakehi, Yutaka; Omoto, Yutaka; and Harada, Takeshi, 4,943,361, Cl. 204-192.320.
Konishi, Nobutake; Ono, Kikuo; Suzuki, Takaya; and Miyata, Kenji, 4,943,837, Cl. 357-23.700.
Kubo, Kanji, 4,943,914, Cl. 364-200.000.
Miyamoto, Hironori; Kondo, Hidefumi; Haga, Hirohide; and Takashi, Rinichi, 4,943,933, Cl. 364-513.000.
Nakajima, Jun; Araya, Takeshi; and Hioki, Susumu, 4,943,701, Cl. 219-124.020.
Ohishi, Tadashi; and Umetsu, Hiroshi, 4,943,164, Cl. 366-149.000.
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Okada, Hideo; Mori, Toshikatsu; Mitsugi, Kouichi; Iwase, Yoshio; Kuroe, Satoshi; Takeuchi, Masato; and Kamo, Tomoichi, 4,943,496, Cl. 429-45.000.
Okinaga, Takayuki; Tachi, Hiroshi; Ozaki, Hiroshi; Otsuka, Kanji; Furukawa, Michiaki; and Yamasaki, Yasuyuki, 4,943,843, Cl. 357-70.000.
Sano, Masaaki; Imagawa, Takao; Nishioka, Kouichi; Narishige, Shinji; Hanazono, Masanobu; Onishi, Takashi; and Yoshida, Toshihiro, 4,943,883, Cl. 360-126.000.
Shinoda, Takashi; and Sakai, Osamu, 4,943,967, Cl. 371-2.200.
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Takano, Hisashi; Hamakawa, Yoshihiro; Shiiki, Kazuo; Otomo, Shigekazu; and Kumasaka, Noriyuki, 4,943,879, Cl. 360-126.000.
Takeda, Hidekazu; Nagai, Kyuichirou; Ogiro, Kenji; Aman, Mitsuji; and Takita, Kouhei, 4,943,874, Cl. 360-85.000.
Yamaguchi, Yasunori; Oishi, Kanji; and Miyazawa, Kazuyuki, 4,943,949, Cl. 365-206.000.
Yamazaki, Takeo; Ogihara, Satoru; Kosugi, Tetsuo; Shirakawa, Shingo; and Owada, Shinichi, 4,943,795, Cl. 338-21.000.
Hitachi Metals, Ltd: *See*—
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Okinaga, Takayuki; Tachi, Hiroshi; Ozaki, Hiroshi; Otsuka, Kanji; Furukawa, Michiaki; and Yamasaki, Yasuyuki, 4,943,843, Cl. 357-70.000.
Hitomi, Nobuteru: *See*—
Sugimoto, Masaki; Morikawa, Kunihiko; Hitomi, Nobuteru; Ikeura, Kenji; Kitahara, Hisashi; Hirano, Hiroyuki; and Takatori, Kazuhiro, 4,942,771, Cl. 73-862.360.
Hlavacek, Robert A.; Dumican, Barry L.; and McCusker, Edward J., to American Cyanamid Company. Surgical repair device having absorbable and nonabsorbable components. 4,942,875, Cl. 606-230.000.
Hoberman, Charles. Reversibly expandable doubly-curved truss structure. 4,942,700, Cl. 52-81.000.
Hoblingre, Andre , to ECIA - Equipments et Composants pour l'Industrie Automobile. Rapid fastener of the bayonet type. 4,943,182, Cl. 403-349.000.
Hoda, Takeo: *See*—
Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, 4,943,825, Cl. 354-481.000.
Hoechst Aktiengesellschaft: *See*—
Diekhaus, Gerhard; and Kappesser, Harald, 4,943,663, Cl. 568-461.000.
Glombik, Heiner; Utz, Roland; Lang, Hans-Jochen; Geisen, Karl; and Beyhl, Friedrich E., 4,943,576, Cl. 514-249.000.
Thoese, Klaus; and Jung, Karl-Heinz, 4,943,510, Cl. 430-160.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Ong, Helen H.; Anderson, Vernon B.; and Profitt, James A., 4,943,571, Cl. 514-232.800.

Hoelderich, Wolfgang; Goetz, Norbert; and Hupfer, Leopold, to BASF Aktiengesellschaft. Preparation of phenylethanols. 4,943,667, Cl. 568-814.000.

Hoffa, Jack L.; and Nazerian, Greg, to Eubanks Engineering Co. Apparatus for step stripping wire means. 4,942,789, Cl. 81-9.510.

Hoffman, Eldon P.: *See*—
Van Horne, Arthur C.; Hoffman, Eldon P.; and Bakke, Paul D., 4,943,045, Cl. 271-277.000.

Hoffmann, Dieter: *See*—
Wahlen, Erika; and Hoffmann, Dieter, 4,943,149, Cl. 350-568.000.

Hoffmann, Heiko: *See*—
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Hoffmann-La Roche Inc.: *See*—
Luthy, Christoph, 4,943,583, Cl. 514-364.000.

Hoffmann, Martin; Schittenheim, Helge; Wierschem, Franz-Rudolf; and Eichhorn, Horst, to Porsche AG. Steering column fastening arrangement for motor vehicles with a deformation element. 4,943,028, Cl. 248-548.000.

Hoffmeister, Lothar: *See*—
Radovan, Giuseppe; Blaseck, Klaus; Hoffmeister, Lothar; Westendorf, Helmut; Sandling, Michael J.; and Davidson, James W., 4,942,897, Cl. 137-454.200.

Hofmann, Heinrich; and Troster, Manfred, to FAG Kugelfischer Georg Schafer (KGaA). Welded connection for wheel bearing unit for motor vehicles. 4,943,171, Cl. 384-537.000.

Hofmeister, Peter: *See*—
Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, 4,943,585, Cl. 514-398.000.
Theobald, Hans; Kuenast, Christoph; Hofmeister, Peter; Neubauer, Hans-Juergen; Kuekenhoehner, Thomas; Krieg, Wolfgang; Leyendecker, Joachim; and Kardorff, Uwe, 4,943,584, Cl. 514-380.000.

Hogan, J. Martin, to City of Hope. Blood collecting apparatus with shielded needles. 4,943,283, Cl. 604-198.000.

Hoger, Ernst; and Obenauf, Eberhard, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Apparatus for performing the remotely-manipulated installation and removal of detachable conduit units. 4,942,661, Cl. 29-723.000.

Hohn, Fritz J.: *See*—
Golladay, Steven D.; Hohn, Fritz J.; Hutson, David J.; Meisburger, William D.; and Rasch, Juergen, 4,943,769, Cl. 324-158.00R.

Hohnoki, Hideaki: *See*—
Kambe, Koichi; Matsuura, Kiyoshi; Seino, Tatsuo; Kimura, Yoshiyuki; Kemmochi, Hiroshi; Yoshioka, Koichi; and Hohnoki, Hideaki, 4,943,418, Cl. 423-50.000.

Hokuriku Pharmaceutical Co., Ltd.: *See*—
Hidaka, Hiroyoshi; Tanaka, Toshio; Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Mitani, Kazuya; and Sakarai, Shunichiro, 4,943,581, Cl. 514-307.000.

Holce, Thomas J.; and Flint, Keith E., to Sentrol, Inc. Wide gap magnetic reed switch and method for manufacture of same. 4,943,791, Cl. 335-153.000.

Holroyd, Nigel J. H.; and Scamans, Geoffrey M., to Alcan International Limited. Welding aluminium alloys. 4,943,492, Cl. 428-654.000.

Holscher, Richard: *See*—
Hellmann, Jens-Holger; Holscher, Richard; Janssen, Hermann J.; Kleemann, Alfred; Rupp, Karl-Heinz; Schwarz, Joachim; Varges, Gunter; and Waas, Heinrich, 4,942,837, Cl. 114-40.000.

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Homeier, Ronald F.: *See*—
Anthony, James R.; Merrick, David; Homeier, Ronald F.; and Lortz, Allan R., 4,942,649, Cl. 24-637.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Aoki, Takashi; Terayama, Satoshi; Iwaki, Yoshihisa; Sekine, Noboru; Shimada, Hiroyuki; Takemasa, Nobuo; and Miyake, Junichi, 4,942,787, Cl. 74-867.000.
Konno, Tsuneo, 4,942,853, Cl. 123-90.160.
Shirai, Hiroshi; Tatsumi, Takashi; Kanda, Hisashi; Fukuo, Koichi; Motsumoto, Masahiko; and Hiro, Toshiaki, 4,942,854, Cl. 123-90.170.
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Honeywell Inc.: *See*—
Aagardl, Roger L.; Bonne, Ulrich; and Matthys, Robert J., 4,944,035, Cl. 364-556.000.
Norton, Peter W.; Stobie, James A.; and Zimmermann, Peter H., 4,943,491, Cl. 428-620.000.
Shireman, Mark J.; and Benson, Florence G., 4,942,843, Cl. 118-74.000.

Honshu Seishi Kabushiki Kaisha: *See*—
Osajima, Yutaka; Yamamura, Katsumi; and Unno, Yoshio, 4,943,552, Cl. 502-417.000.

Hoover, Rocklin. Surgical instrument accounting apparatus and method. 4,943,939, Cl. 364-555.000.

Hopper, Hans P., to British Petroleum Co. p.l.c. ROV intervention on subsea equipment. 4,943,187, Cl. 405-190.000.

Hori, Kouhei, to Kabushiki Kaisha Toshiba. Differential planet gear unit. 4,942,781, Cl. 475-342.000.

Horikawa, Hiroshi; Urabe, Hitoshi; and Yako, Katsutoshi, to Fuji Photo Film Co., Ltd. Compression method for dot image data. 4,943,869, Cl. 358-426.000.

Horiki, Yoshio; and Ikeda, Hideo, to Central Glass Company, Limited. Plate member arrangement. 4,943,179, Cl. 403-269.000.

Horiwaki, Akihiro: *See*—
Sasaki, Kenji; Matsushita, Mitsuo; Ono, Kenzo; Horiwaki, Akihiro; Fujii, Katsunori; and Hatano, Hiroyuki, 4,943,829, Cl. 355-215.000.

Horlogerie Photographique Francaise: *See*—
Cognasse, Christian; Graham, Peter; Maury, Bernard; and Walter, Jean-Claude, 4,944,017, Cl. 381-79.000.

Hormann, Thomas: *See*—
Kopp, Dieter; Hormann, Thomas; and Ackermann, Uwe, 4,943,911, Cl. 364-200.000.

Horodysky, Andrew G.: *See*—
Avery, Noyes L.; Horodysky, Andrew G.; Law, Derek A.; and Rudnick, Leslie R., 4,943,383, Cl. 252-52.00A.

Hort, Roger V.: *See*—
Haessig, David L.; Hamidi, Jamshid; and Hort, Roger V., 4,942,921, Cl. 165-16.000.

Horton, Paul: *See*—
Crews, Phillip; Matthews, Thomas R.; and Horton, Paul, 4,943,589, Cl. 514-468.000.

Horvath, Bruce B.; Hurlbut, Raymond A.; DiFranco, A. Thomas; and Williams, Bruce R. Apparatus and process for automatically dispensing metal alloy paste material for joining metal components. 4,942,998, Cl. 228-102.000.

Hosford, Gregory S., to Sundstrand Corporation. Hot gas generator system. 4,942,733, Cl. 60-267.000.

Hoshi, Katsuji, to NEC Corporation. Digital signal input buffer circuit having a simple construction and capable of retaining data. 4,943,738, Cl. 307-362.000.

Hoshino, Yukio; and Asai, Ko, to NEC Corporation. Identification system employing verification of fingerprints. 4,944,021, Cl. 382-5.000.

Hosiden Electronics Co., Ltd.: *See*—
Ukai, Yasuhiro, 4,943,838, Cl. 357-23.700.

Hosoda, Makoto; and Shiomi, Toshio, to Hamamatsu Photonics Kabushiki Kaisha. Picture operation unit for performing operations on intensity data of neighboring picture elements. 4,943,934, Cl. 364-518.000.

Hosoi, Yuichi: *See*—
Arakawa, Satoshi; Takahashi, Kenji; and Hosoi, Yuichi, 4,944,026, Cl. 250-484.100.

Hotomi, Hideo, to Minolta Camera Kabushiki Kaisha. Ink jet printer. 4,943,818, Cl. 346-140.00R.

Houck, Catherine M.; and Pear, Julie R., to Calgene, Inc. Fruit specific transcriptional factors. 4,943,674, Cl. 800-205.000.

Howard, Frank C.: *See*—
Wolfberg, Robert L.; Golsch, Rudolph A. M.; and Howard, Frank C., 4,942,996, Cl. 227-136.000.

Howarth, Richard F. Fluid actuated method and means for controlling a tool slide. 4,942,650, Cl. 29-38.00B.

Howe, Roger T.; Lang, Jeffrey H.; Schlecht, Martin F.; Schmidt, Martin A.; and Senturia, Stephen D., to Massachusetts Institute of Technology. Electrostatic micromotor. 4,943,750, Cl. 310-309.000.

Hrebenar, Kevin R.: *See*—
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; Deal, James F., III; and Bolden, Paul L., Jr., 4,943,390, Cl. 252-355.000.

Hsu, Pi-Chen, to Shirley S. Lan. Storing box for booster cable. 4,942,964, Cl. 206-334.000.

Huang, Alan, to AT&T Bell Laboratories. Computational origami. 4,943,909, Cl. 364-200.000.

Huang, Carl: *See*—
Baker, Richard W.; Kochinke, Frank; and Huang, Carl, 4,943,435, Cl. 424-448.000.

Huang, Hung-chia. Passive fiber-optic polarization control. 4,943,132, Cl. 350-96.130.

Hudson, Larry G.: *See*—
Bruski, Richard S.; Hudson, Larry G.; and Skibo, Michael D., 4,943,490, Cl. 428-614.000.

Huettemann, Erik W. Load-bearing roof or ceiling assembly made up of insulated concrete panels. 4,942,707, Cl. 52-259.000.

Hug, William F.: *See*—
Campbell, Albert E.; Hug, William F.; and Reid, Ray D., 4,943,928, Cl. 364-477.000.

Huggins, Orville C.; and Mistyurik, John D., to Monarch Marking Systems, Inc. Stacker. 4,943,043, Cl. 271-212.000.

Hugh Steeper Limited: *See*—
Cooper, Robin A.; and Fazackerley, Barry J., 4,943,498, Cl. 429-97.000.

Hughes Aircraft Company: *See*—
Cross, Eugene W., Jr., 4,943,155, Cl. 353-33.000.
Grinberg, Jan; O'Meara, Thomas R., Jr.; and Welkowsky, Murray S., 4,943,709, Cl. 250-201.900.
Rice, Thomas B., 4,943,978, Cl. 375-1.000.
Stephens, Ronald R.; Craig, Richard R.; Yen, Huan W.; and Lind, Richard C., 4,943,782, Cl. 330-4.300.

Hughes, John L.; and Lastavec, Paul, to Austral Asian Lasers Pty. Ltd., a part interest. Laser sawmill. 4,943,700, Cl. 219-121.670.

Huhta-Koivisto, Esko: *See*—
Santasalo, Lauri; and Huhta-Koivisto, Esko, 4,942,847, Cl. 122-35.000.

Humpherys, Allan S.; and Oest, Elvert E., to United States of America, Agriculture; and Elvert Edgar Oest & Company. Irrigation device. 4,943,184, Cl. 405-39.000.
Hunt, William K., to Dakota Manufacturing Co., Inc. Trailer having swing-out side extensions. 4,943,106, Cl. 296-26.000.
Hunter Douglas, Inc.: *See*—
Neff, Craig A., 4,943,454, Cl. 428-12.000.
Hupfer, Leopold: *See*—
Hoelderich, Wolfgang; Goetz, Norbert; and Hupfer, Leopold, 4,943,667, Cl. 568-814.000.
Hurlbut, Raymond A.: *See*—
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Hury, Shlomo: *See*—
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Hwang, Feng-Lin, to Tech Zeal Industrial C., Ltd. Vehicular internal air exhausting device. 4,942,806, Cl. 98-2.020.
Hwang, Frank K.; and Richards, Gaylord W., to AT&T Bell Laboratories. Rearrangeable multiconnection switching networks constructed using combinatorial designs. 4,944,029, Cl. 340-825.800.
Hwang, Jin-Tsair. Fishline storing box. 4,942,691, Cl. 43-54.100.
Hyatt, Gilbert P. Signature filter system. 4,944,036, Cl. 367-43.000.
Hydro Agri Sluiskil B.V.: *See*—
Vanmarcke, Luc A.; and Cardon, Walter E., 4,943,308, Cl. 71-29.000.
Hyodo, Yoshihiko: *See*—
Chujo, Yoshiki; Inoue, Tokuta; Konomi, Toshiaki; and Hyodo, Yoshihiko, 4,942,860, Cl. 123-571.000.
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Facchini, Libero, 4,943,227, Cl. 425-345.000.
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Okamoto, Kaizo; Ichihara, Akira; Sato, Akimune; Hirata, Kenji; Hirayama, Katsuhisa; Hina, Eiji; Nakaji, Shigeru; Sakamoto, Minoru; Tanaka, Takashi; and Shimizu, Keizo, 4,942,773, Cl. 73-864.450.
Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, to Mitutoyo Corporation. Diffraction-type optical encoder with improved detection signal insensitivity to optical grating gap variations. 4,943,716, Cl. 250-231.160.
Ichikawa Woolen Textile Co., Ltd.: *See*—
Yarita, Takao; Moro, Yutaka; Takeishi, Kazuvasu; and Ohashi, Shinichi, 4,943,927, Cl. 364-470.000.
Ichikoh Industries, Ltd.: *See*—
Nakata, Yutaka, 4,943,894, Cl. 362-61.000.
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, to Matsushita Electric Works, Ltd. Portable battery powered electromagnetic therapy application. 4,942,884, Cl. 128-804.000.
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Yamawaki, Takashi, 4,943,615, Cl. 525-240.000.
Igarashi, Ichiro; and Nishimura, Kazuhiko, to Tokai Rubber Industries, Ltd. Rubber hose. 4,942,906, Cl. 138-126.000.
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Kimoto, Takahiro; Ohi, Hideo; Watanabe, Toshihisa; and Nakayama, Tadashi, 4,943,675, Cl. 544-330.000.
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Iino, Atsushi; and Kato, Nobuhide, to NGK Insulators, Ltd. Method of manufacturing an electrochemical device. 4,943,330, Cl. 156-89.000.
Iio, Masahiro, to Diesel Kiki Co., Ltd. Sliding-vane rotary compressor. 4,943,216, Cl. 418-15.000.
Iizuka, Takashi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Reading lens system. 4,943,146, Cl. 350-471.000.
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Horiki, Yoshio; and Ikeda, Hideo, 4,943,179, Cl. 403-269.000.
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Hirai, Ryoji; Yoshizawa, Mitsuru; and Ikeda, Hiroyuki, 4,943,754, Cl. 313-477.00R.
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Sugimoto, Masaki; Morikawa, Kunihiko; Hitomi, Nobuteru; Ikeura, Kenji; Kitahara, Hisashi; Hirano, Hiroyuki; and Takatori, Kazuhiro, 4,942,771, Cl. 73-862.360.
Iles, Roy A. H.: *See*—
Isherwood, Harold; and Iles, Roy A. H., 4,943,446, Cl. 427-9.000.
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Weinstein, Richard, 4,943,005, Cl. 239-223.000.
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Imada, Eiji: *See*—
Nojima, Hideo; Kojima, Yoshimi; Imada, Eiji; Matsuyama, Toshiro; Hayakawa, Takashi; Narikawa, Shiro; and Ehara, Shaw, 4,943,503, Cl. 430-66.000.
Imada, Isuke: *See*—
Terao, Shinji; Okazaki, Hisayoshi; and Imada, Isuke, 4,943,645, Cl. 552-309.000.
Imagawa, Takao: *See*—
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Imai, Hidetoshi: *See*—
Hayashi, Nobuhiro; Tanaka, Toshiichiro; Yamaguchi, Seiji; and Imai, Hidetoshi, 4,942,640, Cl. 15-319.000.
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Sugiura, Masato; Shimizu, Hideo; Imamura, Shigeru; and Sugiura, Fumitoshi, 4,943,380, Cl. 252-8.700.
Imamura, Shuichiro, to Nissan Motor Co., Ltd. Warp transfer control system of loom for filling density change. 4,942,908, Cl. 139-99.000.
Imao, Kaoru; and Watanabe, Hideyuki, to Ricoh Company, Ltd. Method of describing image information. 4,944,023, Cl. 382-37.000.
Imi-Tech Corporation: *See*—
Ferro, Gregory A., 4,943,598, Cl. 521-184.000.
Ferro, Gregory A., 4,943,599, Cl. 521-184.000.
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Frankeny, Richard F.; Haj-ali-Ahmadi, Javad; Imken, Ronald L.; and Wustrau, Rolf, 4,943,242, Cl. 439-65.000.
Immel, Otto; Schwarz, Hans-Helmut; and Thiel, Reinhard, to Bayer Aktiengesellschaft. Supported ruthenium catalyst, its preparation and its use in the preparation of optionally substituted cyclohexylamine and optionally substituted dicyclohexylamine. 4,943,549, Cl. 502-304.000.
Inagaki, Shoji: *See*—
Kamayachi, Yuichi; Sawazaki, Kenji; Suzuki, Morio; and Inagaki, Shoji, 4,943,516, Cl. 430-280.000.
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INCO Alloys International, Inc.: *See*—
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Indiana Mills & Manufacturing, Inc.: *See*—
Anthony, James R.; Merrick, David; Homeier, Ronald F.; and Lortz, Allan R., 4,942,649, Cl. 24-637.000.
Industrias John Deere, S.A. de C.V.: *See*—
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Infrawave A/S: *See*—
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Ingelstrom, Nils A., to Sandvik Aktiebolag. Sintered ceramic materials. 4,943,543, Cl. 501-96.000.
Ingersoll, Clyde E.; Schaffer, Stephen P.; and McCabe, Patrick J., to Williams Dental Company, Inc. Palladium alloy containing gold, silver, gallium, germanium and/or lithium and dental restorations utilizing same. 4,943,483, Cl. 428-433.000.
Inotech AG: *See*—
Oetliker, Hans; Winiger, Peter; and Stempfel, Sonja, 4,943,159, Cl. 356-73.000.
Inoue, Hiromichi; Inukai, Takashi; Saito, Shinichi; Miyazawa, Kazutoshi; and Ohno, Kouji, to Chisso Corporation. Thioether compound and liquid crystal composition. 4,943,385, Cl. 252-299.610.
Inoue, Manabu: *See*—
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Inoue, Masakazu; Asai, Kuniaki; Hieda, Kazuo; and Kobayashi, Tadayasu, to Sumitomo Chemical Company, Limited. Resin composition for printed circuit board. 4,943,606, Cl. 523-457.000.
Inoue, Shuji: *See*—
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Institut des Vaisseaux et du Sang: *See—*
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Institut Francais du Pet.ole: *See—*
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Lesni, Jacques, 4,942,926, Cl. 166-385.000.
Travers, Christine; and Franck, Jean-Pierre, 4,943,546, Cl. 502-66.000.

Institut National de Recherche sur les Transports et leur Securite: *See—*
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Intelligent Modem Corporation: *See—*
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International Business Machines Corporation: *See—*
Aldrich, Charles S.; Craft, James A.; Harden, James P.; Komplin, Steven R.; Rousey, William S.; Shah, Praful M.; Ward II, Earl D.; Wilzbach, Bernard L.; and King, Terry L., 4,943,815, Cl. 346-108.000.
Baker, William T., Jr.; Buffum, Charles M.; Jolissaint, Charles H.; and Kerlin, Gregg W., 4,943,996, Cl. 379-96.000.
Clark, Carl E., 4,943,913, Cl. 364-200.000.
Emma, Philip G.; Knight, Joshua W., III; Pomerene, James H.; Rechtschaffen, Rudolph N.; and Sparacio, Frank J., 4,943,908, Cl. 364-200.000.
Frankeny, Richard F.; Haj-ali-Ahmadi, Javad; Imken, Ronald L.; and Wustrau, Rolf, 4,943,242, Cl. 439-65.000.
Golladay, Steven D.; Hohn, Fritz J.; Hutson, David J.; Meisburger, William D.; and Rasch, Juergen, 4,943,769, Cl. 324-158.00R.
Hevesi, Joseph F., 4,943,753, Cl. 313-440.000.
Lai, Fang-shi, 4,943,945, Cl. 365-189.090.
Pechanek, Gerald G.; Shippy, David J.; Snedaker, Mark C.; and Woodward, Sandra S., 4,943,984, Cl. 375-109.000.
Reidenbach, John R.; and Schopp, Robert E., 4,943,875, Cl. 360-104.000.
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International Flavors & Fragrances Inc.: *See—*
Buckholz, Lawrence L., Jr.; Byrne, Brian; and Sudol, Marion A., 4,943,697, Cl. 219-10.55B.

International Fuel Cells Corporation: *See—*
Vartanian, George, 4,943,493, Cl. 429-17.000.

International Mobile Machines Corporation: *See—*
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Interox Chemicals Limited: *See—*
Dear, Kenneth M.; and Turner, Philip J., 4,943,358, Cl. 204-157.930.

Interox (Societe Anonyme): *See—*
Bouillet, Edmond; Colery, Jean-Claude; Declerck, Claude; and Ledoux, Pierre, 4,942,800, Cl. 86-20.100.

Interplex Electronics, Inc.: *See—*
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InterVentional Technologies, Inc.: *See—*
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Inukai, Takashi: *See—*
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Inzinna, Louis P.: *See—*
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Irgang, Matthias: *See—*
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Irwin, Frank R.: *See—*
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Ise, Youichi: *See—*
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, 4,942,884, Cl. 128-804.000.

Iseli, Andreas: *See—*
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Isherwood, Harold; and Iles, Roy A. H., to Dennison Manufacturing Company. Metallization of substrates. 4,943,446, Cl. 427-9.000.

Ishibashi, Tadashi: *See—*
Takemae, Eiji; Koizumi, Masakazu; and Ishibashi, Tadashi, 4,942,905, Cl. 138-118.000.

Ishida, Masamitsu: *See—*
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Ishida, Toru: *See—*
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Ishigaki, Yukinobu, to Victor Company of Japan, Ltd. Spread spectrum communication system. 4,943,976, Cl. 375-1.000.

Ishiguro, Kazuhisa; and Yamagishi, Mikio, to Sanyo Electric Co., Ltd. Stereo demodulator and a demodulating method thereof. 4,944,010, Cl. 381-4.000.

Ishii, Haruo: *See—*
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 4,944,030, Cl. 354-403.000.

Ishii, Yukihiro: *See—*
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Ishikawa, Masato: *See—*
Tanisake, Hiroka; Okumura, Hiroyuki; Namikawa, Akira; Ishikawa, Masato; and Abe, Toshiaki, 4,943,607, Cl. 523-500.000.

Ishizaki, Yasuo: *See—*
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Ishizu, Akira: *See—*
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Ishizuka, Tetuya: *See—*
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Isobe, Moriyuki: *See—*
Takemura, Hitoshi; Gotoh, Nobuo; and Isobe, Moriyuki, 4,943,730, Cl. 250-492.300.

Isozaki, Shin; and Yagi, Michio, to Konica Corporation. Head supporting structure in disk drive system for double sided flexible disk. 4,943,881, Cl. 360-104.000.

Isuzu Ceramics Research Co., Ltd.: *See—*
Kawamura, Hideo, 4,942,851, Cl. 123-90.110.

Itagaki, Akinari; Yamaya, Masaaki; Yoshioka, Hiroshi; Watanabe, Akihiko; and Miyazato, Keita, to Shin-Etsu Chemical Co., Ltd.; and Nitto Roseki Co., Ltd. Method for improving composite materials by use of a silane coupling agent. 4,943,452, Cl. 427-299.000.

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Ito, Susumu: *See—*
Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ara, Katsutoshi; Ito, Susumu; and Okamoto, Kikuhiko, 4,943,532, Cl. 435-209.000.

Ito, Takashige: *See—*
Yoshino, Hirobumi; Ito, Takashige; Kawase, Junichi; and Maeda, Hiroyuki, 4,944,031, Cl. 355-206.000.

Itoh, Yasuo: *See—*
Hidaka, Hiroyoshi; Tanaka, Toshio; Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Mitani, Kazuya; and Sakurai, Shunichiro, 4,943,581, Cl. 514-307.000.

Itzhak, David, to Bromine Compounds Limited. Method and medium for the coating of metals with tin. 4,943,480, Cl. 428-332.000.

Iwagaya, Takashi; and Nakazato, Tomomi, to Fanuc Ltd. Interfacing method in a numerical control apparatus. 4,943,905, Cl. 364-136.000.

Iwaki, Yoshihisa: *See—*
Aoki, Takashi; Terayama, Satoshi; Iwaki, Yoshihisa; Sekine, Noboru; Shimada, Hiroyuki; Takemasa, Nobuo; and Miyake, Junichi, 4,942,787, Cl. 74-867.000.

Iwasaki, Yasuo: *See—*
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Iwase, Yoshio: *See—*
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Izatt, Reed M.: *See—*
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Izumi, Yoshinori: *See—*
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Izuno, Nobuaki; Kurosu, Yasuo; Okazawa, Koichi; Yokoyama, Yoshihiro; and Ooyu, Kensuke, to Hitachi, Ltd. Synchronizing circuit for an external signal and an internal sampling clock signal. 4,943,857, Cl. 358-148.000.

J. I. Case Company: *See—*
Lech, Richard J., 4,942,935, Cl. 180-133.000.

Jackman, Dennis E.; Combs, Gary W.; and Westphal, Dietmar B., to Mobay Corporation. Process for the production of thiocarbohydrazide. 4,943,660, Cl. 564-18.000.

Jackson, Francis G., to Harter Corporation. Interconnecting structure for releasably securing successive panels in a relocatable wall. 4,942,713, Cl. 52-584.000.

Jackson, Ronald E. Adjustable clamp. 4,943,039, Cl. 269-45.000.

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Jacob, Philippe L.; Noujaim, Sharbel E.; Forman, Glenn A.; and Mallick, John A., to General Electric Company. Electronic circuit breaker using digital circuitry having instantaneous trip capability. 4,943,888, Cl. 361-96.000.

Jacobs, Gregory A.; and Neal, Merrill G., to Yacht-Yok, A California Partnership. Locking security arrangement. 4,942,745, Cl. 70-58.000.

Jacobs, Merrit N.: *See—*
Przybylowicz, Catherine S.; Jacobs, Merrit N.; and Douglas, Joseph S., 4,943,415, Cl. 422-56.000.

Jacobs, Paul T.; Berry, Ronald F.; and Soto, Toby A., to Johnson & Johnson Medical, Inc. Method for vapor sterilizaton of articles having lumens. 4,943,414, Cl. 422-28.000.

Jacobsen, Clas T., to EB Norsk Kabel a.s. Fire and corrosion protected hose. 4,942,903, Cl. 138-110.000.

Jacquinet, Jean-Claude; Petitou, Maurice; Sinay, Pierre; and Choay, Jean, to Choay, S.A. Method for carrying out the organic synthesis of oligosaccharides containing galactosamine-uronic acid patterns, new oligosaccharides obtained and biological applications thereof. 4,943,630, Cl. 536-123.000.

Jahns, Werner: *See*—
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Jaki, Friedrich; and Brammer, Hartmut, to Robert Bosch GmbH. Ignition distributor for an internal combustion engine. 4,942,856, Cl. 123-146.50A.

Jakobs, Karlhans: *See*—
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James L. Taylor Manufacturing Company Inc.: *See*—
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James Mackie & Sons Limited: *See*—
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James River Corporation of Virginia: *See*—
Pollart, Kenneth A.; and Lafferty, Terrence P., 4,943,456, Cl. 428-34.300.

Janda, Dennis J.; Stricharczuk, Paul T.; and Minchak, Robert J., to B. F. Goodrich Company, The. Storage stable components of reactive formulations for bulk polymerization of cycloolefin monomers. 4,943,621, Cl. 526-127.000.

Janke, Donald E.: *See*—
Linstromberg, William J.; Janke, Donald E.; and Scriber, Chris A., 4,942,979, Cl. 221-75.000.

Janome Sewing Machine Co., Ltd.: *See*—
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Janssen, Hermann J.: *See*—
Heilmann, Jens-Holger; Holscher, Richard; Janssen, Hermann J.; Kloemann, Alfred; Rupp, Karl-Heinz; Schwarz, Joachim; Varges, Gunter; and Waas, Heinrich, 4,942,837, Cl. 114-40.000.

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Janssens, Frans E.; Diels, Gaston S. M.; Torremans, Joseph L. G.; and Sommen, Francois M., 4,943,580, Cl. 514-303.000.
Raeymaekers, Alfons H. M.; Freyne, Eddy J. E.; Van Gelder, Josephu L. H.; and Venet, Marc G., 4,943,574, Cl. 514-338.000.

Janssens, Frans E.; Diels, Gaston S. M.; Torremans, Joseph L. G.; and Sommen, Francois M., to Janssen Pharmaceutica N.V. Anti-histaminic benzimidazole, imidazopyridine and purine derivatives. 4,943,580, Cl. 514-303.000.

Japan Aircraft Development Corporation: *See*—
Uda, Akira; Yoshida, Yoshio; Harada, Makoto; and Sato, Masaaki, 4,942,739, Cl. 62-93.000.

Japan Metals & Chemicals Co., Ltd.: *See*—
Kambe, Koichi; Matsuura, Kiyoshi; Seino, Tatsuo; Kimura, Yoshiyuki; Kemmochi, Hiroshi; Yoshioka, Koichi; and Hohnoki, Hideaki, 4,943,418, Cl. 423-50.000.

Japan Tobacco Inc.: *See*—
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Jarvinen, Markku S.; Novaky, Mikael J. H.; and Rommi, Heikki P. J., to A. Ahlstrom Corporation. Method of testing cores. 4,942,769, Cl. 73-82.100.

Jawish, Robert. External fastener for bones and joints. 4,942,872, Cl. 606-57.000.

Jay, Murray, to Jay, Vivian. Hermetically sealed canister. 4,942,970, Cl. 215-358.000.

Jay, Vivian: *See*—
Jay, Murray, 4,942,970, Cl. 215-358.000.

Jenkins, David P.; and Edmundson, James T., to British Steel plc. Regenerative burner system. 4,943,231, Cl. 431-215.000.

Jenkins, James F.: *See*—
Capron, Mark E.; and Jenkins, James F., 4,942,975, Cl. 220-23.400.

Jensen, C. Allen: *See*—
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Jensen Corporation: *See*—
McCabe, Stanley G., 4,943,198, Cl. 414-13.000.

JEOL Ltd.: *See*—
Takemura, Hitoshi; Gotoh, Nobuo; and Isobe, Moriyuki, 4,943,730, Cl. 250-492.300.

Jines, Michael D.: *See*—
Krumholz, Frank C.; and Jines, Michael D., 4,942,708, Cl. 52-263.000.

Jinnouchi, Takeshi, to Eagle Industry Co., Ltd. Shaft seal disposed about a rotatable shaft. 4,943,069, Cl. 277-27.000.

Jitsukata, Kouji: *See*—
Yakushiji, Shigenori; and Jitsukata, Kouji, 4,943,835, Cl. 357-23.130.

Joh, Gunter; and Sedinnayr, Wilhelm. Intake manifold. 4,942,907, Cl. 138-157.000.

Johann, Gerhard: *See*—
Angermann, Alfred; Franke, Helga; and Johann, Gerhard, 4,943,310, Cl. 71-88.000.

Johnson, Alan D.: *See*—
Hartwigsen, Wesley D.; Johnson, Alan D.; Beckham, Jeffrey C.; and White, Kenneth L., 4,942,982, Cl. 222-195.000.

Johnson, Carl E. A.; Ormsby, Jay L.; Chase, Eric T.; Quackenbos, George S.; Broude, Sergey V.; and Bou dour, Abdu, to QC Optics, Inc. Inspection apparatus and method for detecting flaws on a diffractive surface. 4,943,734, Cl. 250-572.000.

Johnson & Johnson Medical, Inc.: *See*—
Jacobs, Paul T.; Berry, Ronald F.; and Soto, Toby A., 4,943,414, Cl. 422-28.000.

Johnson, Thomas A.: *See*—
Carr, Richard V. C.; and Johnson, Thomas A., 4,943,633, Cl. 540-531.000.

Johnson, Thomas H., to Shell Oil Company. Process for preparing linear alpha, omega difunctional molecules. 4,943,396, Cl. 260-405.500.

Johnson, Thomas H., to Shell Oil Company. Metathesis of functional olefins. 4,943,397, Cl. 260-405.500.

Johnson, Tony. Production of improved infant care articles. 4,943,896, Cl. 362-84.000.

Johnson, Walter A.: *See*—
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,943,322, Cl. 420-417.000.

Jolissaint, Charles H.: *See*—
Baker, William T., Jr.; Buffum, Charles M.; Jolissaint, Charles H.; and Kerlin, Gregg W., 4,943,996, Cl. 379-96.000.

Jolles, Pierre; Fiat, Anne-Marie; Soria, Claudine; Levy-Toledano Sylviane; Raha, Sanghamitra; Mazoyer, Elisabeth; and Drouet, Ludovic, to Institut des Vaisseaux et du Sang; and Centre National de la Recherche Scientifique. Tetra- and pentapeptides containing the lysyl-arginyl-aspartyl sequence and their applications as medicines, particularly anti-thrombotic medicines. 4,943,562, Cl. 514-18.000.

Jones, Barbara L. Electronic probe. 4,943,720, Cl. 250-306.000.

Jones, Jimmie J.; Watson, Sherman L.; and Pence, Charles F., to Complete Hydraulic Building Systems, Inc. Hydraulic winch system for use in erecting clear-span, pole-type buildings. 4,942,701, Cl. 52-126.100.

Jordan, Rodney B. Free standing golf bag apparatus. 4,942,962, Cl. 206-315.700.

Jordan, Shelby A.; and Apgar, John W., Sr., to Litigation Innovations, Inc. Document organizer. 4,943,177, Cl. 402-72.000.

Joslyn, Edward P.: *See*—
Nesser, Thomas A.; Nesser, Deborah L.; Luckower, Herbert; Barczak, John P.; Joslyn, Edward P.; and Rick, Bernard J., 4,942,954, Cl. 194-351.000.

Judd, Duncan B.: *See*—
Naylor, Alan; Judd, Duncan B.; and Brown, Dearg S., 4,943,578, Cl. 514-252.000.

Jull, George W.: *See*—
Alden, Adrian W.; Jull, George W.; and Ohno, Tom T., 4,943,811, Cl. 343-814.000.

Jung, Johann: *See*—
Schulz, Guenter; Schubert, Juergen; Sauter, Hubert; Grosmann, Klaus; and Jung, Johann, 4,943,315, Cl. 71-120.000.

Jung, Karl-Heinz: *See*—
Thoese, Klaus; and Jung, Karl-Heinz, 4,943,510, Cl. 430-160.000.

Jung, Wayne. Band saw blade fixture. 4,943,042, Cl. 269-296.000.

Jupiter Products, Inc.: *See*—
Miller, Kevin W., 4,942,989, Cl. 224-42.45R.

Jurgens, Gunter, to Daimler-Benz AG. Arrangement for an automatic shifting of an epicyclic, shiftable transmission of a motor vehicle. 4,942,785, Cl. 74-867.000.

Juve, Ronald A.; and Kaufman, George S. Audio compression circuit for television audio signals. 4,944,015, Cl. 381-55.000.

Kabe, Kazuyuki: *See*—
Takahashi, Ken; Kabe, Kazuyuki; and Suzuki, Tatsuo, 4,942,914, Cl. 152-531.000.

Kabelmetal Electro GmbH: *See*—
Richter, Siegfried; Schauer, Friedrich; and Bauernfeind, Peter, 4,943,757, Cl. 318-468.000.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Ohkubo, Masahiro, 4,942,779, Cl. 475-39.000.

Kabushiki Kaisha Kenwood: *See*—
Watanabe, Hiroshi, 4,944,019, Cl. 381-90.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Yanagawa, Masahiro; Abe, Mutsumi; Aota, Kenichi; and Motoda, Takashi, 4,943,319, Cl. 75-229.000.

Kabushiki Kaisha Marukomu: *See*—
Kikuchi, Makoto; and Harada, Manabu, 4,943,416, Cl. 422-63.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Takeda, Tadashi; Ueno, Noboru; and Miyazaki, Yasumitsu, 4,943,129, Cl. 350-96.120.

Kabushiki Kaisha Shinsangyokaihatsu: *See*—
Mushika, Sadahiko; and Suzuki, Akira, 4,942,735, Cl. 60-416.000.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Yamamoto, Toshimasa; and Nishimura, Yuji, 4,943,010, Cl. 242-107.40A.

Kabushiki Kaisha Toshiba: *See*—
Ando, Hideo, 4,944,037, Cl. 369-13.000.
Asahina, Hiroshi; and Ogura, Ichiro, 4,943,987, Cl. 378-99.000.
Hori, Kouhei, 4,942,781, Cl. 475-342.000.
Imamiya, Keniti; Tanaka, Sumio; Miyamoto, Junichi; Atsumi, Shigeru; Ohtsuka, Nobuaki; and Saito, Shinji, 4,943,962, Cl. 365-230.080.
Kasano, Akira; and Inoue, Yoichi, 4,943,937, Cl. 364-521.000.
Kawahara, Tutomu, 4,943,876, Cl. 360-106.000.
Mori, Seiichi, 4,943,836, Cl. 357-23.500.
Nakamura, Nobutaka, 4,943,910, Cl. 364-200.000.
Okazaki, Yoji; Nitta, Yukami; and Harada, Shigeyoshi, 4,943,173, Cl. 400-689.000.
Sakui, Koji; Fuse, Tsuneaki; and Masuoka, Fujio, 4,943,944, Cl. 365-189.050.
Sato, Fumitaka, 4,943,935, Cl. 364-518.000.

Sugita, Naomasa; Yotumoto, Yoshiharu; Moriguchi, Kouji; and Sekiba, Toshinobu, 4,943,842, Cl. 357-51.000.
Tomura, Shinya; and Yasuda, Sachiko, 4,943,504, Cl. 430-102.000.
Watanabe, Yohji; and Ohsawa, Takashi, 4,943,745, Cl. 307-603.000.
Yakushiji, Shigenori; and Jitsukata, Kouji, 4,943,835, Cl. 357-23.130.
Yamashita, Hiroshi, 4,943,166, Cl. 369-32.000.
Yoshinaga, Yoshio; Shimizu, Wataru; and Obara, Toshio, 4,943,868, Cl. 358-403.000.
Kabushikikaisha Kibun: *See*—
Nozaki, Hisashi; and Sakurai, Seiya, 4,943,444, Cl. 426-573.000.
Kabushikikaisha Kyowashokuhin: *See*—
Nozaki, Hisashi; and Sakurai, Seiya, 4,943,444, Cl. 426-573.000.
Kacar, Cynthia R.: *See*—
Kacar, David J.; and Kacar, Cynthia R., 4,943,105, Cl. 296-24.200.
Kacar, David J.; and Kacar, Cynthia R. Automobile pet seat and cargo carrier. 4,943,105, Cl. 296-24.200.
Kacza, Martin; Rest, Hartmut; and Born, Eberhard, to Bayer Aktiengesellschaft. Hollow section, in particular a tube, of long fibre reinforced plastic. 4,942,904, Cl. 138-89.000.
Kafi, Foroud. Device for driving rodests from subterranean burrows. 4,943,953, Cl. 367-139.000.
Kafka, Fred Y.; Bice, Archie R.; and Burchett, Donald K., to Du Pont de Nemours, E. I., and Company. Process for removing chloroprene dimers from polychloroprene. 4,943,402, Cl. 264-141.000.
Kageyama, Sadashi; Abe, Yoshio; Yasumoto, Yoshio; Inoue, Shuji; Takai, Hitoshi; Matsumoto, Mitsujiro; Aono, Kouji; Uchimura, Kiyoshi, and Eiji, Iwasaki, to Matsushita Electric Industrial Co., Ltd. Multiplex signal processing apparatus. 4,944,032, Cl. 358-12.000.
Kakehi, Yutaka; Omoto, Yutaka; and Harada, Takeshi, to Hitachi, Ltd. Plasma treating method and apparatus therefor. 4,943,361, Cl. 204-192.320.
Kakeya, Nobuharu: *See*—
Nishizawa, Susumu; Muro, Hiroyuki; Kasai, Masayasu; Hatano, Satoru; Kamiya, Syouzi; Kakeya, Nobuharu; and Kitao, Kazuhiko, 4,943,567, Cl. 514-203.000.
Kallen, Wilhelm; and Quack, Ulrich, to Eisengiesserei Monforts GmbH & Co. Process for production of a hollow casting. 4,942,915, Cl. 164-34.000.
Kamata, Yoshikiyo, to Kioritz Corporation. Centrifugal clutch. 4,942,952, Cl. 192-105.0CD.
Kamayachi, Yuichi; Sawazaki, Kenji; Suzuki, Morio; and Inagaki, Shoji, to Taiyo Ink Manufacturing Co., Ltd. Photosensitive thermosetting resin composition and method of forming solder resist pattern by use thereof. 4,943,516, Cl. 430-280.000.
Kambe, Koichi; Matsuura, Kiyoshi; Seino, Tatsuo; Kimura, Yoshiyuki; Kemmochi, Hiroshi; Yoshioka, Koichi; and Hohnoki, Hideaki, to Japan Metals & Chemicals Co., Ltd. Method of preparing high-purity manganese compounds. 4,943,418, Cl. 423-50.000.
Kami, Tomohiro: *See*—
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, 4,942,884, Cl. 128-804.000.
Kamiya, Masaaki: *See*—
Hayashi, Yutaka; Kojima, Yoshikazu; Kamiya, Masaaki; and Tanaka, Kojiro, 4,943,943, Cl. 365-185.000.
Kamiya, Sigeru: *See*—
Takeda, Kenji; Kamiya, Sigeru; Suzuki, Satosi; and Yoshino, Yasuhisa, 4,943,123, Cl. 303-111.000.
Kamiya, Syouzi: *See*—
Nishizawa, Susumu; Muro, Hiroyuki; Kasai, Masayasu; Hatano, Satoru; Kamiya, Syouzi; Kakeya, Nobuharu; and Kitao, Kazuhiko, 4,943,567, Cl. 514-203.000.
Kamo, Tomoichi: *See*—
Okada, Hideo; Mori, Toshikatsu; Mitsugi, Kouichi; Iwase, Yoshio; Kuroe, Satoshi; Takeuchi, Masato; and Kamo, Tomoichi, 4,943,496, Cl. 429-45.000.
Kanamura, Tomotsugu; Shibata, Toshihiko; and Inoue, Yasuji, to Mitsubishi Rayon Co., Ltd. Conductive sheet having electromagnetic interference shielding function. 4,943,477, Cl. 428-286.000.
Kanda, Hisashi: *See*—
Shirai, Hiroshi; Tatsumi, Takashi; Kanda, Hisashi; Fukuo, Koichi; Motsumoto, Masahiko; and Hiro, Toshiaki, 4,942,854, Cl. 123-90.170.
Kane, John P.: *See*—
Protter, Andrew A.; Vigne, Jean-Louis; Mallory, Joanne B.; Talmadge, Karen D.; and Kane, John P., 4,943,527, Cl. 435-69.600.
Kanegae, Hidetoshi; Tomikashi, Minoru; Hino, Akira; and Ueno, Takashi, to Nissan Motor Company, Limited. Trouble checking apparatus. 4,943,924, Cl. 364-431.120.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Tsunemi, Hidenari; Fushiki, Yasuo; Nishimura, Asaichi; and Kawai, Yousuke, 4,943,474, Cl. 428-246.000.
Uekita, Masakazu; Awaji, Hiroshi; Murata, Makoto; and Mizunuma, Satoshi, 4,943,471, Cl. 428-220.000.
Kaneko, Kazuhiko: *See*—
Watanabe, Mitsugu; Kaneko, Kazuhiko; and Matsumoto, Etsuji, 4,943,241, Cl. 439-34.000.
Kaneko, Noriyuki: *See*—
Sakaguchi, Akihiro; Kaneko, Noriyuki; Saruta, Toshio; and Sawano, Ryotaro, 4,943,332, Cl. 156-146.000.
Kanema, Seiichi: *See*—
Aoshima, Toshihisa; Kanema, Seiichi; and Kato, Takeshi, 4,943,938, Cl. 364-522.000.
Kaneshige, Ryousuke: *See*—
Kinoshita, Tatsuo; Minami, Shuji; Mizui, Kinya; and Kaneshige, Ryousuke, 4,943,658, Cl. 562-572.200.
Kanner, Rowland W.: *See*—
Rabenau, Richard; Kanner, Rowland W.; and Cerola, Joseph J., 4,943,704, Cl. 219-275.000.
Kantor, Paul; and Perry, Loren R., to Conway Products Company. Spa with door access filter and control. 4,942,630, Cl. 4-542.000.
Kanzaki Kokyukoki Mfg., Co., Ltd.: *See*—
Fujisaki, Koichiro; Ohashi, Ryota; and Nemoto, Shusuke, 4,942,780, Cl. 475-83.000.
Mihara, Toshihide; and Odan, Yuji, 4,942,657, Cl. 29-568.000.
Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Osaki, Shigeyoshi, 4,943,778, Cl. 324-636.000.
Kao Corporation: *See*—
Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ara, Katsutoshi; Ito, Susumu; and Okamoto, Kikuhiko, 4,943,532, Cl. 435-209.000.
Kapala, Patrick; and Mareix, Jean-Pierre, to Societe Nationale d'Etude et de Construction de Moteurs d–Aviation (SNECMA). Fastener system for a jet engine mounting. 4,943,013, Cl. 244-54.000.
Kapon, Elyahou: *See*—
Deri, Robert J.; and Kapon, Elyahou, 4,943,133, Cl. 350 96.140.
Kappesser, Harald: *See*—
Diekhaus, Gerhard; and Kappesser, Harald, 4,943,663, Cl. 568-461.000.
Karadi, Zoltan: *See*—
Detre, Tamas; Angyan, Sandor; Pap, Laszlo; Szego, Andras; Karadi, Zoltan; Bertus nee Bende, Klara; and Marmarosi nee Kellner, Katalin, 4,943,307, Cl. 71-3.000.
Kardorff, Uwe: *See*—
Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, 4,943,585, Cl. 514-398.000.
Theobald, Hans; Kuenast, Christoph; Hofmeister, Peter; Neubauer, Hans-Juergen; Kuekenhoehner, Thomas; Krieg, Wolfgang; Leyendecker, Joachim; and Kardorff, Uwe, 4,943,584, Cl. 514-380.000.
Karim, Naimul, to Minnesota Mining and Manufacturing Company. Radiation-curable pressure-sensitive adhesive having improved adhesion to plasticized vinyl substrates. 4,943,461, Cl. 428-40.000.
Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Gerstner-Stevens, Ditmar; and Schrod, Josef, 4,943,009, Cl. 242-42.000.
Karlsson, Leif E., to General Engineering (Netherlands) B.V. Electrical connection. 4,943,240, Cl. 439-15.000.
Karlsson, Markku, to Valmet Paper Machinery Inc. Method in the drying of a paper web or equivalent. 4,942,674, Cl. 34-18.000.
Kasai, Masayasu: *See*—
Nishizawa, Susumu; Muro, Hiroyuki; Kasai, Masayasu; Hatano, Satoru; Kamiya, Syouzi; Kakeya, Nobuharu; and Kitao, Kazuhiko, 4,943,567, Cl. 514-203.000.
Kasai, Naomi, to Nippon Thompson Co., Ltd. Thin type linear motion rolling guide unit with apparatus for preventing deviation of holder. 4,943,169, Cl. 384-43.000.
Kasano, Akira; and Inoue, Yoichi, to Kabushiki Kaisha Toshiba. Apparatus for processing images having desired gray levels including a three-dimensional frame memory. 4,943,937, Cl. 364-521.000.
Kasdan, Leon M.: *See*—
Scherzinger, William M.; Chu, Tsuwei; and Kasdan, Leon M., 4,943,746, Cl. 310-61.000.
Kato, Hideo: *See*—
Hidaka, Hiroyoshi; Tanaka, Toshio; Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Mitani, Kazuya; and Sakurai, Shunichiro, 4,943,581, Cl. 514-307.000.
Kato, Katsuo: *See*—
Hirose, Ichiro; Kato, Katsuo; and Inamura, Motonori, 4,943,272, Cl. 493-45.000.
Kato, Keiichi: *See*—
Kumagai, Motoo; Kato, Keiichi; Nagano, Masato; and Sakaguchi, Michiaki, 4,943,469, Cl. 428-209.000.
Kato, Kouichi: *See*—
Uchida, Yoshitaka; and Kato, Kouichi, 4,943,977, Cl. 375-1.000.
Kato, Kunioki; Kawamura, Masao; Goda, Hiroshi; Sawada, Kiyoshi; and Hamatani, Kazuhiro, to Seitetsu Kagaku Co., Ltd. Salt of 5-acetyl-2-alkylbenzenesulfonic acid. 4,943,655, Cl. 562-46.000.
Kato, Nobuhide: *See*—
Iino, Atsushi; and Kato, Nobuhide, 4,943,330, Cl. 156-89.000.
Kato, Takeshi: *See*—
Aoshima, Toshihisa; Kanema, Seiichi; and Kato, Takeshi, 4,943,938, Cl. 364-522.000.
Katz, David H.: *See*—
Eisinger, Robert W.; Khalil, Mohammed H.; Katz, David H.; and Sargeant, Robert B., 4,943,522, Cl. 435-7.000.
Katznelson, Ron D., to M/A-COM Government Systems, Inc.; and Cable/Home Communication Corp. Extended definition television. 4,943,847, Cl. 358-12.000.
Kaub, Manfred, to Lucas Industries public limited company. Pneumatic brake booster piston with sleeve defining quick-fill input chamber. 4,942,738, Cl. 60-550.000.
Kaufman, George S.: *See*—
Juve, Ronald A.; and Kaufman, George S., 4,944,015, Cl. 381-55.000.
Kaufmann, Dieter: *See*—
Enderle, Eckhard; Aehnelt, Hans-Peter; and Kaufmann, Dieter, 4,942,671, Cl. 33-559.000.

Kawabata, Hiroshi; Kobayashi, Katsuhiko; and Sato, Hideo, to Chisso Corporation. Photocurable and dyeable resin composition with bisazide and dyeable acrylic copolymer. 4,943,512, Cl. 430-197.000.
Kawabata, Misao, to Bridgestone Corporation. Method of manufacturing pneumatic tire. 4,943,331, Cl. 156-129.000.
Kawagoe, Jun: *See*—
Kitada, Akira; Yamazaki, Kikuo; Matsuda, Terumi; and Kawagoe, Jun, 4,943,727, Cl. 250-483.100.
Kawaguchi, Takeo: *See*—
Nakano, Masahiro; Fukushima, Shoji; Kawaguchi, Takeo; and Suzuki, Yoshiki, 4,943,564, Cl. 514-50.000.
Kawaguchi, Tomihisa; Ota, Akira; and Kawasaki, Akira. Method of preserving wine in a bottle and a wine preserving container. 4,942,960, Cl. 206-205.000.
Kawahara, Tutomu, to Kabushiki Kaisha Toshiba. Magnetic head positioning apparatus for floppy disk drive. 4,943,876, Cl. 360-106.000.
Kawai, Satoshi: *See*—
Watanabe, Masao; Mizoguchi, Shuri; Kawai, Satoshi; Takahashi, Kiyohiko; and Tanimura, Toyokiti, 4,943,206, Cl. 414-786.000.
Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ara, Katsutoshi; Ito, Susumu; and Okamoto, Kikuhiko, to Kao Corporation. Alkali-resistant cellulases and microorganisms capable of producing same. 4,943,532, Cl. 435-209.000.
Kawai, Yousuke: *See*—
Tsunemi, Hidenari; Fushiki, Yasuo; Nishimura, Asaichi; and Kawai, Yousuke, 4,943,474, Cl. 428-246.000.
Kawamoto, Tomoyuki: *See*—
Mendelsohn, John; Kawamoto, Tomoyuki; Sato, Gordon; and Sato, J. Denry, 4,943,533, Cl. 435-240.270.
Kawamura, Hideo, to Isuzu Ceramics Research Co., Ltd. Electromagnetic valve control system. 4,942,851, Cl. 123-90.110.
Kawamura Institute of Chemical Research: *See*—
Takehara, Sadao; Fujisawa, Toru; Arai, Yoshi; and Kurokawa, Jitsuo, 4,943,386, Cl. 252-299.650.
Kawamura, Masao: *See*—
Kato, Kunioki; Kawamura, Masao; Goda, Hiroshi; Sawada, Kiyoshi; and Hamatani, Kazuhiro, 4,943,655, Cl. 562-46.000.
Kawasaki, Akira: *See*—
Kawaguchi, Tomihisa; Ota, Akira; and Kawasaki, Akira, 4,942,960, Cl. 206-205.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Uda, Akira; Yoshida, Yoshio; Harada, Makoto; and Sato, Masaaki, 4,942,739, Cl. 62-93.000.
Kawasaki, Ken-ichiro, to Pioneer Electronic Corporation. Rotary head type digital-audio reproducing device with improved track-deviation detecting system. 4,943,873, Cl. 360-77.150.
Kawasaki Steel Corp.: *See*—
Okamoto, Kaizo; Ichihara, Akira; Sato, Akimune; Hirata, Kenji; Hirayama, Katsuhisa; Hina, Eiji; Nakaji, Shigeru; Sakamoto, Minoru; Tanaka, Takashi; and Shimizu, Keizo, 4,942,773, Cl. 73-864.450.
Kawasawa, Takashi: *See*—
Nakamoto, Mitsuharu; Sano, Kazuhiko; and Kawasawa, Takashi, 4,943,555, Cl. 503-227.000.
Kawase, Junichi: *See*—
Yoshino, Hirobumi; Ito, Takashige; Kawase, Junichi; and Maeda, Hiroyuki, 4,944,031, Cl. 355-206.000.
Kawashima, Haruo: *See*—
Endo, Shigeo; Kawashima, Haruo; Hirata, Kimio; Saito, Yasuo; Uchiya, Takao; and Yanagi, Hideo, 4,943,398, Cl. 264-82.000.
Kawatta, Ken: *See*—
Okazaki, Masaki; Yabe, Masao; and Kawatta, Ken, 4,943,515, Cl. 430-270.000.
KDI Electro-Tec Corporation: *See*—
Speer, J. Alexander, 4,943,137, Cl. 350-96.180.
Keith, Peter T.: *See*—
Euteneuer, Charles L.; Mattison, Richard C.; Adams, Daniel O.; Hektner, Thomas R.; and Keith, Peter T., 4,943,278, Cl. 604-96.000.
Keller, Gerhard; and Iseli, Andreas, to AISA Automation Industrielle S.A. Method and apparatus for manufacturing compression molded articles from thermoplastic material. 4,943,405, Cl. 264-322.000.
Kelley, Brian: *See*—
Magnus, George; and Kelley, Brian, 4,943,649, Cl. 536-124.000.
Kelly, Shayne A.: *See*—
Fischer, Frank E.; and Kelly, Shayne A., 4,942,992, Cl. 224-240.000.
Kemeny, Matthias D. Portable display system. 4,942,686, Cl. 40-610.000.
Kemmochi, Hiroshi: *See*—
Kambe, Koichi; Matsuura, Kiyoshi; Seino, Tatsuo; Kimura, Yoshiyuki; Kemmochi, Hiroshi; Yoshioka, Koichi; and Hohnoki, Hideaki, 4,943,418, Cl. 423-50.000.
Kemp, David R. Containment device for a test tube. 4,942,966, Cl. 206-521.000.
Kemp, Preston B., Jr.; and Johnson, Walter A., to GTE Products Corporation. Spherical titanium based powder particles. 4,943,322, Cl. 420-417.000.
Kempter, Paul C.: *See*—
Waechter, Jerome R.; Patten, James T.; and Kempter, Paul C., 4,943,963, Cl. 370-94.100.
Kerk, Stephan: *See*—
Bankel, Adolf; Strauss, Hans; and Kerk, Stephan, 4,942,816, Cl. 102-235.000.
Kerlin, Gregg W.: *See*—
Baker, William T., Jr.; Buffum, Charles M.; Jolissaint, Charles H.; and Kerlin, Gregg W., 4,943,996, Cl. 379-96.000.
Kern & Co. Ltd.: *See*—
Wahlen, Erika; and Hoffmann, Dieter, 4,943,149, Cl. 350-568.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Lammertz, Herbert; and Kroth, Kornelius, 4,943,394, Cl. 252-628.000.
Khaladji, Jean; and Peltier, Marcel, to Rhone-Poulenc Industries. Rare earth polishing compositions. 4,942,697, Cl. 51-283.00R.
Khalil, Mohammed H.: *See*—
Eisinger, Robert W.; Khalil, Mohammed H.; Katz, David H.; and Sargeant, Robert B., 4,943,522, Cl. 435-7.000.
Kido, Tomoyuki, to Diahatsu Motor Co., Ltd. Steering mechanism for vehicle rear wheels. 4,943,074, Cl. 280-91.000.
Kiesel, Kenneth C.: *See*—
Barker, Ronald C.; Schuler, Chester L.; Kiesel, Kenneth C.; and Moxon, Edwin C., 4,943,866, Cl. 358-335.000.
Kihara, Seiichiro; and Okabayashi, Naonori, to Sharp Kabushiki Kaisha. Waveform converting apparatus. 4,943,736, Cl. 307-261.000.
Kihara, Seiji: *See*—
Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; and Mitsudo, Makoto, 4,943,541, Cl. 501-10.000.
Kijima, Takao; Edahiro, Takeshi; Koyama, Toshihide; and Taniguchi, Haruyuki, to Mazda Motor Corporation. Vehicle suspension mechanism. 4,943,082, Cl. 280-673.000.
Kikuchi, Makoto; and Harada, Manabu, to Kabushiki Kaisha Marukomu. Automatic urinalysis system. 4,943,416, Cl. 422-63.000.
Kikuta, Ritsuo: *See*—
Niimura, Yoshihiro; Kikuta, Ritsuo; and Usui, Katsuaki, 4,943,214, Cl. 418-9.000.
Kim, Chung-Bin: *See*—
Tencza, Thomas M.; and Kim, Chung-Bin, 4,943,565, Cl. 514-161.000.
Kim, Woo-Jin: *See*—
Lee, Jong-Seob, 4,943,747, Cl. 310-67.00R.
Kimoto, Takahiro; Ohi, Hideo; Watanabe, Toshihisa; and Nakayama, Tadashi, to Ihara Chemical Industry Co., Ltd. Anilinopyrimidine derivatives. 4,943,675, Cl. 544-330.000.
Kimura, Toshio: *See*—
Todo, Akira; Kimura, Toshio; Minoda, Takeshi; and Kurisu, Masayoshi, 4,943,611, Cl. 524-493.000.
Kimura, Tsutomu: *See*—
Ono, Shuji; and Kimura, Tsutomu, 4,943,725, Cl. 250-327.200.
Kimura, Yoshiyuki: *See*—
Kambe, Koichi; Matsuura, Kiyoshi; Seino, Tatsuo; Kimura, Yoshiyuki; Kemmochi, Hiroshi; Yoshioka, Koichi; and Hohnoki, Hideaki, 4,943,418, Cl. 423-50.000.
Kincer, Dale R.: *See*—
Kincer, Louis T.; Kincer, Dale R.; and Kincer, Denny L., 4,942,643, Cl. 19-44.000.
Kincer, Denny L.: *See*—
Kincer, Louis T.; Kincer, Dale R.; and Kincer, Denny L., 4,942,643, Cl. 19-44.000.
Kincer, Louis T.; Kincer, Dale R.; and Kincer, Denny L. Mechanical cottonseed delinter. 4,942,643, Cl. 19-44.000.
King, Charles B.: *See*—
Stern, Joseph A.; Green, Stephen L.; King, Charles B.; and May, Sharon B., 4,942,626, Cl. 2-161.00R.
King Industries, Inc.: *See*—
Gallacher, Lawrence V.; and Condos, Harry N., 4,943,656, Cl. 562-90.000.
King, Richard T. Spacer element for multiglazed windows and windows using the element. 4,942,704, Cl. 52-171.000.
King, Terry L.: *See*—
Aldrich, Charles S.; Craft, James A.; Harden, James P.; Komplin, Steven R.; Rousey, William S.; Shah, Praful M.; Ward II, Earl D.; Wilzbach, Bernard L.; and King, Terry L., 4,943,815, Cl. 346-108.000.
Kingston Technologies Limited Partnership: *See*—
Stoy, Vladimir A.; Stoy, George P.; and Lovy, Jan, 4,943,618, Cl. 525-340.000.
Kinoshita, Akira; Matsuzawa, Yumi; and Yoshizawa, Hideo, to Konica Corporation. Photoconductive material containing anti-oxidant. 4,943,501, Cl. 430-58.000.
Kinoshita, Kazunori: *See*—
Ito, Katsuo; Hibino, Eiichi; Nishimura, Masahiro; Kinoshita, Kazunori; and Takase, Shigeki, 4,943,810, Cl. 343-702.000.
Kinoshita, Tatsuo; Minami, Shuji; Mizui, Kinya; and Kaneshige, Ryousuke, to Mitsui Petrochemical Industries, Ltd. Liquid oxidatively modified ethylenic random copolymer, process of making and use. 4,943,658, Cl. 562-572.200.
Kioritz Corporation: *See*—
Kamata, Yoshikiyo, 4,942,952, Cl. 192-105.0CD.
Kitada, Akira; Yamazaki, Kikuo; Matsuda, Terumi; and Kawagoe, Jun, to Fuji Photo Film Co., Ltd. Radiographic intensifying screen. 4,943,727, Cl. 250-483.100.
Kitagawa, Fumio: *See*—
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, 4,942,884, Cl. 128-804.000.
Kitagawa Industries, Co., Ltd.: *See*—
Nakano, Yoshihito, 4,943,183, Cl. 403-406.100.

Kitahara, Hisashi: *See*—
Sugimoto, Masaki; Morikawa, Kunihiko; Hitomi, Nobuteru; Ikeura, Kenji; Kitahara, Hisashi; Hirano, Hiroyuki; and Takatori, Kazuhiro, 4,942,771, Cl. 73-862.360.

Kitsi, Koji, to SSMC Inc. Looper shifting device in overlock sewing machine. 4,942,834, Cl. 112-199.000.

Kitamura, Hideo; and Nakagawa, Ichiro, to Takata Corporation. Seat belt retractor with tension-reducing winding mechanism. 4,943,011, Cl. 242-107.000.

Kitao, Kazuhiko: *See*—
Nishizawa, Susumu; Muro, Hiroyuki; Kasai, Masayasu; Hatano, Satoru; Kamiya, Syouzi; Kakeya, Nobuharu; and Kitao, Kazuhiko, 4,943,567, Cl. 514-203.000.

Kitaura, Hiromu; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, to Matsushita Electric Industrial Co., Ltd. TV signal recording and reproducing apparatus employing a digital interface and including signal drop-out compensation. 4,943,858, Cl. 358-167.000.

Kitoh, Atsunori: *See*—
Morio, Tomokazu; Fujimoto, Yoshiji; and Kitoh, Atsunori, 4,944,012, Cl. 381-30.000.

Kizuik, Brent L.; and Gurevich, Richard D., to Comcheq Services Limited. Rotary dial pulse receiver. 4,944,001, Cl. 379-386.000.

Kleemann, Alfred: *See*—
Hellmann, Jens-Holger; Holscher, Richard; Janssen, Hermann J.; Kleemann, Alfred; Rupp, Karl-Heinz; Schwarz, Joachim; Varges, Gunter; and Waas, Heinrich, 4,942,837, Cl. 114-40.000.

Klein, Horst: *See*—
Rocholl, Hans; and Klein, Horst, 4,942,945, Cl. 188-202.000.

Klein, Lawrence F.: *See*—
Besson, Clark K.; Caridis, Andrew A.; and Klein, Lawrence F., 4,942,808, Cl. 99-404.000.

Klimpl, Fred E.: *See*—
Medney, Jonas; and Klimpl, Fred E., 4,943,334, Cl. 156-174.000.

Klobucar, W. Dirk; Eisenbraun, Allan A.; and Zumstein, Ronald C., to Ethyl Corporation. Production of particulate polyimide polymers. 4,943,682, Cl. 528-353.000.

Kloptleisch, Kim A.: *See*—
Conley, Walter, III; and Kloptleisch, Kim A., 4,943,756, Cl. 318-671.000.

Klumpp, Rolf: *See*—
Wagner, Wolf-Dietrich; Klumpp, Rolf; Strobel, Wolfgang; and Brenker, Gunter, 4,942,858, Cl. 123-193.00H.

Klundt, Kalvin K., to Big Time Toy Co., The. Bubble making toy with two wands and a wick comprising three segments. 4,943,255, Cl. 446-15.000.

Knapp, Alfons, to Masco Corporation. Mixing cartridge faucet with parts that can apply pressure to the valve plates of hard material. 4,942,902, Cl. 137-625.170.

Knapp, Ronald K., to Y-Tex Corporation. Power-driven applicator for tagging livestock. 4,943,294, Cl. 606-117.000.

Knauss, Uwe: *See*—
Pertl, Peter; and Knauss, Uwe, 4,943,158, Cl. 356-4.000.

Knight, Joshua W., III: *See*—
Emma, Philip G.; Knight, Joshua W., III; Pomerene, James H.; Rechtschaffen, Rudolph N.; and Sparacio, Frank J., 4,943,908, Cl. 364-200.000.

Knight, Malcolm R. M.: *See*—
Melling, Raymond J.; and Knight, Malcolm R. M., 4,943,093, Cl. 283-83.000.

Kobayashi, Katsuhiko: *See*—
Kawabata, Hiroshi; Kobayashi, Katsuhiko; and Sato, Hideo, 4,943,512, Cl. 430-197.000.

Kobayashi, Tadayasu: *See*—
Inoue, Masakazu; Asai, Kuniaki; Hieda, Kazuo; and Kobayashi, Tadayasu, 4,943,606, Cl. 523-457.000.

Kobayashi, Takeo: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 4,944,030, Cl. 354-403.000.

Kobayashi, Toshiyuki: *See*—
Terada, Takao; and Kobayashi, Toshiyuki, 4,942,874, Cl. 128-203.160.

Kobayashi, Yasuaki, to NEC Corporation. Semiconductor memory device with an improved serial addressing structure. 4,943,947, Cl. 365-189.120.

Kobori, Takahide: *See*—
Gomyo, Shiro; and Kobori, Takahide, 4,943,620, Cl. 525-474.000.

Koch, Byron W.; and Badenhope, Robert I., to Farley, Inc. Expendable casting core for a cylinder. 4,942,917, Cl. 164-369.000.

Koch, Mark; and Murray, Richard C., Jr., to Spectramed, Inc. Fiber optic CO_2 sensor. 4,943,364, Cl. 204-415.000.

Kochinke, Frank: *See*—
Baker, Richard W.; Kochinke, Frank; and Huang, Carl, 4,943,435, Cl. 424-448.000.

Kohmoto, Shinsuke: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 4,944,030, Cl. 354-403.000.

Kohonen, Raimo, to A. Ahlstrom Corporation. Method and apparatus of discharging a disc filter. 4,943,372, Cl. 210-324.000.

Kohri, Toshitaro: *See*—
Demizu, Ichiro; Nakamura, Mitsutoshi; and Kohri, Toshitaro, 4,943,506, Cl. 430-109.000.

Koito Manufacturing Co., Ltd.: *See*—
Shibata, Hiroki; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, 4,943,893, Cl. 362-37.000.

Koizumi, Masakazu: *See*—
Takemae, Eiji; Koizumi, Masakazu; and Ishibashi, Tadashi, 4,942,905, Cl. 138-118.000.

Kojima, Hideo: *See*—
Shimizu, Mitsuo; Maehara, Kazuo; Shinohara, Hidenobu; and Kojima, Hideo, 4,943,003, Cl. 237-2.00B.

Kojima, Toshikuni: *See*—
Tsuchiya, Sohji; Kudoh, Yasuo; Kojima, Toshikuni; Fukuyama, Masao; and Yoshimura, Susumu, 4,943,892, Cl. 361-525.000.

Kojima, Yoshikazu: *See*—
Hayashi, Yutaka; Kojima, Yoshikazu; Kamiya, Masaaki; and Tanaka, Kojiro, 4,943,943, Cl. 365-185.000.

Kojima, Yoshimi: *See*—
Nojima, Hideo; Kojima, Yoshimi; Imada, Eiji; Matsuyama, Toshiro; Hayakawa, Takashi; Narikawa, Shiro; and Ehara, Shaw, 4,943,503, Cl. 430-66.000.

Kokogawa, Tohru: *See*—
Niki, Kenichi; Kokogawa, Tohru; Ishizu, Akira; and Takasago, Hayato, 4,943,768, Cl. 324-158.00F.

Kollmorgen Corporation: *See*—
Byrne, John V.; McMullin, Francis; Devitt, Francis; O'Dwyer, Jeremiah; Murphy, John; Egan, Michael; Brosnan, Michael; and Lawton, James, 4,943,760, Cl. 318-701.000.

Kolody, Stepan M.: *See*—
Saveliev, Viktor S.; Yablokov, Evgeny G.; Prokubovsky, Vladimir I.; Kolody, Stepan M.; Saveliev, Sergei V.; and Smirnov, Ary A., 4,943,297, Cl. 606-200.000.

Kolts, John H.; Brown, Scott H.; and Tooley, Patricia A., to Phillips Petroleum Company. Catalysts for oxidation of carbon monoxide. 4,943,550, Cl. 502-327.000.

Komatsu, Takahiro; Kumanoya, Masaki; Dosaka, Katsumi; and Konishi, Yasuhiro, to Mitsubishi Denki Kabushiki Kaisha. Self-refreshing of dynamic random access memory device and operating method therefor. 4,943,960, Cl. 365-222.000.

Komeda, Takashi: *See*—
Funakubo, Hiroyasu; Dohi, Takeyoshi; Sakuma, Ichiro; and Komeda, Takashi, 4,943,296, Cl. 606-166.000.

Komerska, James; Petito, George; and Rybalka, Borys, to Semex Medical, Inc. Nail treatment device. 4,943,462, Cl. 428-42.000.

Komori Printing Machinery Co., Ltd.: *See*—
Arai, Shigeji, 4,942,813, Cl. 101-152.000.

Komori, Shinji: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,943,916, Cl. 364-200.000.

Komplin, Steven R.: *See*—
Aldrich, Charles S.; Craft, James A.; Harden, James P.; Komplin, Steven R.; Rousey, William S.; Shah, Praful M.; Ward II, Earl D.; Wilzbach, Bernard L.; and King, Terry L., 4,943,815, Cl. 346-108.000.

Komurasaki, Takeshi: *See*—
Takada, Hiromi; Suzuki, Takami; Shiina, Toshio; Okamoto, Keiji; Komurasaki, Takeshi; Yoshioka, Satoru; Sakuma, Nobuo; and Matsuura, Tadashi, 4,943,128, Cl. 350-6.900.

Kondex Corporation: *See*—
Loring, Maurice, 4,942,728, Cl. 56-296.000.

Kondo, Hidefumi: *See*—
Miyamoto, Hironori; Kondo, Hidefumi; Haga, Hirohide; and Takashi, Rinichi, 4,943,933, Cl. 364-513.000.

Kondo, Kazuo: *See*—
Shiromizu, Hisaharu; Morikawa, Asao; Sukegawa, Tsuneyuki; and Kondo, Kazuo, 4,943,470, Cl. 428-209.000.

Kondoh, Shigeru: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 4,944,030, Cl. 354-403.000.

Konica Corporation: *See*—
Isozaki, Shin; and Yagi, Michio, 4,943,881, Cl. 360-104.000.
Kinoshita, Akira; Matsuzawa, Yumi; and Yoshizawa, Hideo, 4,943,501, Cl. 430-58.000.
Watanabe, Masao; Mizoguchi, Shuri; Kawai, Satoshi; Takahashi, Kiyohiko; and Tanimura, Toyokiti, 4,943,206, Cl. 414-786.000.
Yoshizawa, Tomomi; Ogi, Keiji; Tosaka, Yasuo; Kuramoto, Kazuya; and Nonaka, Yoshiyuki, 4,943,518, Cl. 430-378.000.

Konishi, Keisuke, to Omron Tateisi Electronics Co. Limit switch having means to evaluate its actuating stroke. 4,943,715, Cl. 250-229.000.

Konishi, Nobutake; Ono, Kikuo; Suzuki, Takaya; and Miyata, Kenji, to Hitachi, Ltd. Thin film semiconductor device and method of fabricating the same. 4,943,837, Cl. 357-23.700.

Konishi, Yasuhiro: *See*—
Komatsu, Takahiro; Kumanoya, Masaki; Dosaka, Katsumi; and Konishi, Yasuhiro, 4,943,960, Cl. 365-222.000.

Konishiroku Photo Instruy Co., Ltd.: *See*—
Takahashi, Jiro; Tsuzita, Kenzi; Takagiwa, Hiroyuki; Shigeta, Kunio; and Masaki, Hiroya, 4,943,507, Cl. 430-120.000.

Konno, Tsuneo, to Honda Giken Kogyo Kabushiki Kaisha. Valve operating apparatus for an internal combustion engine. 4,942,853, Cl. 123-90.160.

Konomi, Toshiaki: *See*—
Chujo, Yoshiki; Inoue, Tokuta; Konomi, Toshiaki; and Hyodo, Yoshihiko, 4,942,860, Cl. 123-571.000.

Konrad Doppelmayr & Sohn Maschinenfabrik Gesellschaft m.b.H. & Co. KG: *See*—
Meindl, Bernd, 4,942,823, Cl. 104-178.000.

Kopp, Dieter; Hormann, Thomas; and Ackermann, Uwe, to Alcatel N.V. System for loading initial program loader routine into secondary computer without bootstrap ROM. 4,943,911, Cl. 364-200.000.

Kosco, William C.: *See*—
Koski, Richard D.; Kosco, William C.; and Dumais, Arthur, 4,943,773, Cl. 324-207.130.

Kosemura, Masaki: *See*—
Aishima, Shizuo; Takahashi, Yoshito; Kosemura, Masaki; and Ohkawara, Masaaki, 4,943,449, Cl. 427-213.300.

Koshinaka, Eiichi: *See*—
Hidaka, Hiroyoshi; Tanaka, Toshio; Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Mitani, Kazuya; and Sakurai, Shunichiro, 4,943,581, Cl. 514-307.000.

Koski, Richard D.; Kosco, William C.; and Dumais, Arthur, to MagneTek Controls. Magnetostrictive linear displacement transducer having preselected zero crossing detector. 4,943,773, Cl. 324-207.130.

Koskinen, Matti; and Brostrom, Pekka, to Rautaruukki Oy. Loading trailer. 4,943,193, Cl. 410-69.000.

Koslin, Betram L., to Touchstone Applied Science Associates, Inc. Test answer and score sheet device. 4,943,239, Cl. 434-353.000.

Kosten, Richard B.: *See*—
Gerke, Burton E., Jr.; and Kosten, Richard B., 4,942,641, Cl. 15-338.000.

Kostyk, Douglas: *See*—
Fiet, Zeev; Kostyk, Douglas; and Woods, Robert J., 4,943,971, Cl. 372-46.000.

Kosugi, Tetsuo: *See*—
Yamazaki, Takeo; Ogihara, Satoru; Kosugi, Tetsuo; Shirakawa, Shingo; and Owada, Shinichi, 4,943,795, Cl. 338-21.000.

Kothe, Lutz. Syringe. 4,943,281, Cl. 604-192.000.

Koudsi, Antoine J.: *See*—
Al-Sioufi, Habib; and Koudsi, Antoine J., 4,942,881, Cl. 128-763.000.

Koyama, Noriyuki: *See*—
Onishi, Makoto; Seita, Yukio; and Koyama, Noriyuki, 4,943,373, Cl. 210-500.420.

Koyama, Toshihide: *See*—
Kijima, Takao; Edahiro, Takeshi; Koyama, Toshihide; and Taniguchi, Haruyuki, 4,943,082, Cl. 280-673.000.

Kozachuk, John: *See*—
Chalifoux, Raymond J.; and Kozachuk, John, 4,942,920, Cl. 165-1.000.

Kozub, George. Process for the preparation of sterilized plant matter. 4,942,717, Cl. 53-428.000.

Kramer, Karl H., to First Eastern Equities, Inc. Ceramic article, process for imprinting ceramic articles and apparatus. 4,943,684, Cl. 428-34.400.

Kratz, Helmut: *See*—
Bonifer, Edgar; Duttine, Walter; Jahns, Werner; and Kratz, Helmut, 4,942,957, Cl. 198-781.000.

Kraus, Anton: *See*—
Levacher, Friedrich K.; Federmann, Helmut; Noack, Georg; and Kraus, Anton, 4,943,714, Cl. 250-227.160.

Kreuder, Hans-Joachim: *See*—
Ebert, Wolfgang; Meyer, Rolf-Volker; and Kreuder, Hans-Joachim, 4,943,623, Cl. 528-272.000.

Kriebernegg, August; and Lanzer, Heribert, to Steyr-Daimler-Puch AG. Liquid friction coupling and motor vehicle comprising the same. 4,942,951, Cl. 192-58.00C.

Krieg, Wolfgang: *See*—
Theobald, Hans; Kuenast, Christoph; Hofmeister, Peter; Neubauer, Hans-Juergen; Kuekenhoehner, Thomas; Krieg, Wolfgang; Leyendecker, Joachim; and Kardorff, Uwe, 4,943,584, Cl. 514-380.000.

Kroth, Kornelius: *See*—
Lammertz, Herbert; and Kroth, Kornelius, 4,943,394, Cl. 252-628.000.

Kroth, Neil. Push-button cover assembly. 4,943,694, Cl. 200-332.100.

Krueger, Hans; and Welsch, Wolfgang, to Siemens Aktiengesellschaft. Laser tube. 4,943,972, Cl. 372-107.000.

Krug, Herbert: *See*—
Dockner, Toni; Sauerwald, Manfred; Krug, Herbert; and Irgang, Matthias, 4,943,671, Cl. 585-642.000.

Kruis, Peter: *See*—
Young, John S.; Kruis, Peter; and Blewitt, William D., 4,943,958, Cl. 370-77.000.

Krumholz, Frank C.; and Jines, Michael D., to Wenger Corporation. Panel assembly and support structure for elevated floors. 4,942,708, Cl. 52-263.000.

Krupp Corpoplast Maschinenbau GmbH: *See*—
Reymann, Wolfgang; Gropp, Heiko-Ulrich; Vogel, Klaus; and Muller, Hartwig, 4,943,228, Cl. 425-526.000.
Reymann, Wolfgang; Gropp, Heiko-Ulrich; Vogel, Klaus; Muller, Hartwig; and Wiedenfeld, Walter, 4,943,229, Cl. 425-535.000.

Kryos Energy Inc.: *See*—
Markbreiter, Stephen J.; Dessanti, Daniel J.; and Schorr, Hans P., 4,942,734, Cl. 60-39.020.

Kubo, Kanji, to Hitachi, Ltd. Storage control system in which real address portion of TLB is on same chip as BAA. 4,943,914, Cl. 364-200.000.

Kubota Ltd.: *See*—
Kuhara, Akio; Yoshitake, Akira; Torigoe, Takeshi; and Amako, Shinji, 4,943,489, Cl. 428-586.000.

Kucharek, Andrzej. Seal frame and method of use. 4,943,686, Cl. 174-52.00F.

Kudo, Yoshinobu: *See*—
Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, 4,943,825, Cl. 354-481.000.

Kudoh, Yasuo: *See*—
Tsuchiya, Sohji; Kudoh, Yasuo; Kojima, Toshikuni; Fukuyama, Masao; and Yoshimura, Susumu, 4,943,892, Cl. 361-525.000.

Kuekenhoehner, Thomas: *See*—
Theobald, Hans; Kuenast, Christoph; Hofmeister, Peter; Neubauer, Hans-Juergen; Kuekenhoehner, Thomas; Krieg, Wolfgang; Leyendecker, Joachim; and Kardorff, Uwe, 4,943,584, Cl. 514-380.000.

Kuenast, Christoph: *See*—
Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, 4,943,585, Cl. 514-398.000.
Theobald, Hans; Kuenast, Christoph; Hofmeister, Peter; Neubauer, Hans-Juergen; Kuekenhoehner, Thomas; Krieg, Wolfgang; Leyendecker, Joachim; and Kardorff, Uwe, 4,943,584, Cl. 514-380.000.

Kuhara, Akio; Yoshitake, Akira; Torigoe, Takeshi; and Amako, Shinji, to Kubota Ltd. Composite pipe having excellent corrosion resistance and mechanical properties to withstand high temperatures and high pressures. 4,943,489, Cl. 428-586.000.

Kuhn, James O. Fat-removing culinary implement. 4,942,811, Cl. 99-495.000.

Kuijk, Karel E., to U.S. Philips Corporation. Display device. 4,943,802, Cl. 340-784.000.

Kumagai, Motoo; Kato, Keiichi; Nagano, Masato; and Sakaguchi, Michiaki, to Canon Kabushiki Kaisha; and Nippon Oil & Fats Co. Ltd. Ceramic, circuit substrate and electronic circuit substrate by use thereof and process for producing ceramic. 4,943,469, Cl. 428-209.000.

Kumagai, Takenori, to Shimizu Construction Co., Ltd. Openable roof and structure therewith. 4,942,698, Cl. 52-6.000.

Kumano, Masafumi; and Yamamoto, Kenji, to Ricoh Company, Ltd.; and Ricoh Research Institute of General Electronics. Contact type image sensor. 4,943,839, Cl. 357-30.000.

Kumanoya, Masaki: *See*—
Komatsu, Takahiro; Kumanoya, Masaki; Dosaka, Katsumi; and Konishi, Yasuhiro, 4,943,960, Cl. 365-222.000.

Kumasaka, Noriyuki: *See*—
Takano, Hisashi; Hamakawa, Yoshihiro; Shiiki, Kazuo; Otomo, Shigekazu; and Kumasaka, Noriyuki, 4,943,879, Cl. 360-126.000.

Kuno, Hiroaki: *See*—
Fujita, Shigekiyo; Kurushima, Toyokazu; Kuno, Hiroaki; and Hiraiwa, Hiromitsu, 4,943,298, Cl. 606-158.000.

Kurahashi, Kazuo: *See*—
Iijima, Kenzaburou; Hayashi, Yoshinori; and Kurahashi, Kazuo, 4,944,028, Cl. 324-207.120.

Kurahashi, Shigeki: *See*—
Suetaka, Hiroyuki; and Kurahashi, Shigeki, 4,943,867, Cl. 358-342.000.

Kuramoto, Kazuya: *See*—
Yoshizawa, Tomomi; Ogi, Keiji; Tosaka, Yasuo; Kuramoto, Kazuya; and Nonaka, Yoshiyuki, 4,943,518, Cl. 430-378.000.

Kureha Rubber Industry Co., Ltd.: *See*—
Shuji, Inoue, 4,943,467, Cl. 428-159.000.

Kurihara, Takao; Hamatsu, Masahiro; and Mori, Masaharu, to Clarion Co., Ltd. Spread spectrum communication receiver. 4,943,975, Cl. 375-1.000.

Kurisu, Masayoshi: *See*—
Todo, Akira; Kimura, Toshio; Minoda, Takeshi; and Kurisu, Masayoshi, 4,943,611, Cl. 524-493.000.

Kurita, Takashi: *See*—
Shibata, Hiroki; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, 4,943,893, Cl. 362-37.000.

Kuroe, Satoshi: *See*—
Okada, Hideo; Mori, Toshikatsu; Mitsugi, Kouichi; Iwase, Yoshio; Kuroe, Satoshi; Takeuchi, Masato; and Kamo, Tomoichi, 4,943,496, Cl. 429-45.000.

Kurokawa, Jitsuo: *See*—
Takehara, Sadao; Fujisawa, Toru; Arai, Yoshi; and Kurokawa, Jitsuo, 4,943,386, Cl. 252-299.650.

Kurosu, Yasuo: *See*—
Izuno, Nobuaki; Kurosu, Yasuo; Okazawa, Koichi; Yokoyama, Yoshihiro; and Ooyu, Kensuke, 4,943,857, Cl. 358-148.000.

Kurtz, Leonard D.; and LiCausi, Joseph, to BioResearch, Inc. Liquid reinfusion bag system. 4,943,288, Cl. 604-408.000.

Kurushima, Toyokazu: *See*—
Fujita, Shigekiyo; Kurushima, Toyokazu; Kuno, Hiroaki; and Hiraiwa, Hiromitsu, 4,943,298, Cl. 606-158.000.

Kusunoki, Toshio: *See*—
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, 4,942,884, Cl. 128-804.000.

Kuwayama, Yoshinari; Yokoyama, Fumitomo; and Miura, Masakatsu, to Aisin-Warner Kabushiki Kaisha. Reverse shift control device on automatic transmission. 4,942,782, Cl. 74-866.000.

Kvanta, Endre; Pedersen, Anders; and Alexandersson, Lars, to AB Medipharm. Process for supply of biologically active materials to ease materials. 4,943,437, Cl. 426-61.000.

Kyoden, Yasuhiro: *See*—
Yokoyama, Takayuki; and Kyoden, Yasuhiro, 4,943,812, Cl. 346-1.100.

Kyoto Pharmaceutical Industries, Ltd.: *See*—
Nishizawa, Susumu; Muro, Hiroyuki; Kasai, Masayasu; Hatano, Satoru; Kamiya, Syouzi; Kakeya, Nobuharu; and Kitao, Kazuhiko, 4,943,567, Cl. 514-203.000.

Kyushu Refractories Co., Ltd.: *See*—
Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; and Mitsudo, Makoto, 4,943,541, Cl. 501-10.000.

Laboratorios Del Dr. Esteve, S.A.: *See*—
Constansa, Jordi F.; Corominas, Juan P.; and Pinol, Augusto C., 4,943,570, Cl. 514-222.800.

Lacourciere, Robert C., to Leaksealers, Inc. Coating application system for high voltage terminals and areas thereraround and method. 4,943,448, Cl. 427-58.000.

Ladney, Michael: *See*—
Hendry, James W., 4,943,407, Cl. 264-572.000.

Lafferty, Terrence P.: *See*—
Pollart, Kenneth A.; and Lafferty, Terrence P., 4,943,456, Cl. 428-34.300.

Lafforgue, Jean-Jacques; and Schwartz, Claude, to Societe de Prospection et d'Inventions Techniques (S.P.I.T.). Drill bit having a shank with grooves. 4,943,192, Cl. 408-226.000.

Lai, Fang-shi, to International Business Machines Corporation. Reference voltage generator for precharging bit lines of a transistor memory. 4,943,945, Cl. 365-189.090.

Lai, Hoi K.; Davis, Robert A.; and Blem, Allen R., to Uniroyal Chemical Company, Inc.; and Uniroyal Chemical Ltd/Ltee. Azole derivatives of spiroheterocycles. 4,943,311, Cl. 71-90.000.

Lai, Ming-Der. Multi purpose cartridge type handle assembly and tools. 4,942,894, Cl. 132-323.000.

Lai, Ta-Wang: *See*—
Pinschmidt, Robert K., Jr.; and Lai, Ta-Wang, 4,943,676, Cl. 525-383.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Ledon, Henry; Louise, Jean; and Cocolios, Panayotis, 4,943,422, Cl. 423-242.000.

Lamb, Arlene E.: *See*—
Bardai, Zaher; Rolph, Randy K.; Lamb, Arlene E.; Longo, Robert T.; Manoly, Arthur E.; and Forman, Ralph, 4,943,343, Cl. 156-643.000.

Lambert, Thomas W., to Analogic Corporation. Apparatus and method for exposing photosensitive recording media with digital image data. 4,943,861, Cl. 358-244.000.

Lammertz, Herbert; and Kroth, Kornelius, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of storing radioactive waste without risk of hydrogen escape. 4,943,394, Cl. 252-628.000.

Lander, Jack R., to United States Surgical Corporaiton. Self-seating flapper valve for an insufflation cannula assembly. 4,943,280, Cl. 604-169.000.

Lane, Fred J. Birdfeeder attachable to a mailbox. 4,942,845, Cl. 119-52.200.

Lang, Aage, to Milliken Denmark A/S. Sealing system for diaphragm type vulcanizing process. 4,943,070, Cl. 277-235.00R.

Lang, Anthony; and Bloch, Paul, deceased (by Bloch, Linda R., legal representative), to Thorn EMI plc. Replication of carriers bearing digitally recorded information. 4,943,126, Cl. 350-3.690.

Lang, Hans-Jochen: *See*—
Glombik, Heiner; Utz, Roland; Lang, Hans-Jochen; Geisen, Karl; and Beyhl, Friedrich E., 4,943,576, Cl. 514-249.000.

Lang, Jeffrey H.: *See*—
Howe, Roger T.; Lang, Jeffrey H.; Schlecht, Martin F.; Schmidt, Martin A.; and Senturia, Stephen D., 4,943,750, Cl. 310-309.000.

Lang, Paul W.; and Gribshaw, Franklin C., to Gold Stake; Jensen, C. Allen; and Levy, Gregory D. 360 degree viewing system having a liquid crystal display screen encircling a rotatable projection screen. 4,943,851, Cl. 358-87.000.

Lange International S.A.: *See*—
Benetti, Cristiano, 4,942,680, Cl. 36-119.000.

Lange, Peter M.: *See*—
Mitschker, Alfred; Lange, Peter M.; Hoffmann, Heiko; Lossmann, Gunter; van der Meer, Andries P.; and Smit, Cornelius J., 4,943,420, Cl. 423-112.000.

Langen, Hans: *See*—
Helling, Gunter; Sobel, Johannes; and Langen, Hans, 4,943,519, Cl. 430-512.000.

Langer, Adolf: *See*—
Schlamp, Guenther; Gall, Klaus P.; Langer, Adolf; and Ptaschek, Georg, 4,943,362, Cl. 204-298.130.

Langley, Marshall E., Jr.; Sims, Robert C.; Sims, Richard M.; and Turek, James N., to Turek Marketing International. Rebar and beam bolster, slab and beam bolster upper. 4,942,714, Cl. 52-687.000.

Langner, Carl: *See*—
Poran, Michael; Langner, Carl; and Hury, Shlomo, 4,942,919, Cl. 164-420.000.

Lantero, Donna M.: *See*—
Malachosky, Edward; and Lantero, Donna M., 4,942,929, Cl. 175-66.000.

Lanzer, Heribert: *See*—
Kriebernegg, August; and Lanzer, Heribert, 4,942,951, Cl. 192-58.00C.

LaPierre, Rene B.: *See*—
Fischer, Ronald H.; LaPierre, Rene B.; Owens, Peter J.; and Varghese, Philip, 4,943,366, Cl. 208-68.000.

Lark, Jay S.; Erman, Lee D.; Fehling, Michael; and Hayes-Roth, Frederick, to Cimflex Teknowledge Corporation. Architecture for composing computational modules uniformly across diverse developmental frameworks. 4,943,932, Cl. 364-513.000.

Larock, Warren D. Portable camera support. 4,943,820, Cl. 354-82.000.

Laroulandie, Pierre J.: *See*—
Dannoux, Thierry L.; Laroulandie, Pierre J.; and Themont, Jean-Pierre, 4,943,130, Cl. 350-96.120.

Larrison, Owen D., to Sealright Company, Inc. Tamper evident container. 4,942,974, Cl. 220-214.000.

Larson, James H.: *See*—
Vork, William D.; and Larson, James H., 4,942,899, Cl. 137-454.500.

Lastavec, Paul: *See*—
Hughes, John L.; and Lastavec, Paul, 4,943,700, Cl. 219-121.670.

Lathim, Delbert L.; Liu, Ting; and Foley, Charles F., to Research & Development of North Carolina. Ball-like article. 4,943,066, Cl. 273-415.000.

Laundre', John W.; Reynolds, Timothy D.; and Reynolds, Mary B. Solar collector. 4,943,125, Cl. 350-96.100.

Lavalette, Annette: *See*—
Hewel, Manfred; Lavalette, Annette; and Annighofer, Frank, 4,943,625, Cl. 528-324.000.

Lavielle, Gilbert; and Poignant, Jean C., to Adir Et Cie. Piperazinylalkylpiperazinedione compounds. 4,943,577, Cl. 514-250.000.

Laviron, Charles: *See*—
Dubreux, Bernard; and Laviron, Charles, 4,943,654, Cl. 560-251.000.

Law, Derek A.: *See*—
Avery, Noyes L.; Horodysky, Andrew G.; Law, Derek A.; and Rudnick, Leslie R., 4,943,383, Cl. 252-52.00A.

Law, Norman. Child's collapsible car seat. 4,943,112, Cl. 297-238.000.

Laws, Peter G.; and Fletcher, Graham J., to Plessey Overseas Limited. Broad band VCO control system for clock recovery. 4,943,788, Cl. 331-11.000.

Lawson, Darl. Shirt lettering and illustrating form. 4,942,683, Cl. 38-102.910.

Lawton, James: *See*—
Byrne, John V.; McMullin, Francis; Devitt, Francis; O'Dwyer, Jeremiah; Murphy, John; Egan, Michael; Brosnan, Michael; and Lawton, James, 4,943,760, Cl. 318-701.000.

Lazarus, Richard M.; Reardon, Edward J.; and Dixit, Sunit S., to Morton Thiokol, Inc. High sensitivity mid and deep UV resist. 4,943,511, Cl. 430-192.000.

Leaksealers, Inc.: *See*—
Lacourciere, Robert C., 4,943,448, Cl. 427-58.000.

Leavell, David R.; Spencer, Earl W., Jr.; and Bacon, Bruce L., to Microsonics, Inc. Depth finder with tutorial. 4,943,951, Cl. 367-111.000.

Leban, Johann J.: *See*—
Gilbert, Walter; Fisher, Richard A.; Sato, Vicki L.; and Leban, Johann J., 4,943,627, Cl. 530-324.000.

Lech, Richard J., to J. I. Case Company. Auxiliary power steering system. 4,942,935, Cl. 180-133.000.

Ledon, Henry; Louise, Jean; and Cocolios, Panayotis, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for treatment of gaseous effluents containing sulfur dioxide with oxygen. 4,943,422, Cl. 423-242.000.

Ledoux, Pierre: *See*—
Bouillet, Edmond; Colery, Jean-Claude; Declerck, Claude; and Ledoux, Pierre, 4,942,800, Cl. 86-20.100.

Lee, Harry E., Jr., to Engineering & Precision Machining, Inc. Surgical pin site shield. 4,943,293, Cl. 606-96.000.

Lee, Jong-Seob, to Kim, Woo-Jin; and Lee, Jong-Seob. Brushless unequal poles controlled electric motor. 4,943,747, Cl. 310-67.00R.

Lee, Minyoung: *See*—
Taub, Alan I.; Lee, Minyoung; and Hibbs, Louis E., Jr., 4,942,798, Cl. 83-636.000.

Lee, Robert D.; and Dias, Donald R., to Dallas Semiconductor Corporation. Electronic key locking circuitry. 4,943,804, Cl. 340-825.310.

Lee, Y. C. Rear view mirror mounted reversing distance sensor. 4,943,796, Cl. 340-435.000.

Lefebvre, Byron; and Schoen, Jelle P., to Purifiner Manufacturing Company. Oil reclamation device. 4,943,352, Cl. 196-46.100.

Legare, Thomas G., III, to Environmental Technology (U.S.), Inc. Method for removing dissolved heavy metals from waste oils, industrial wastewaters, or any polar solvent. 4,943,377, Cl. 210-709.000.

Leggett & Platt, Incorporated: *See*—
Scott, Terence A.; and Yates, Chester R., 4,942,636, Cl. 5-475.000.

Lehigh University: *See*—
Regen, Steven L., 4,943,624, Cl. 528-301.000.

Leichter, Louis M.: *See*—
Brown, David E.; and Leichter, Louis M., 4,943,638, Cl. 548-455.000.

Leitner, Heinz: *See*—
Brueckmann, Ralf; Leitner, Heinz; and Schoepke, Holger, 4,943,602, Cl. 524-600.000.

Leland Stanford University, The Board of Trustees of the: *See*—
Akamine, Shinya; Albrecht, Thomas R.; and Carver, Thomas E., 4,943,719, Cl. 250-306.000.

Lemasson, Paul. Pre-fabricated panel for building, particularly for burial vaults. 4,942,702, Cl. 52-127.700.

Lengel, James D.: *See*—
Frey, Gary A.; and Lengel, James D., 4,942,944, Cl. 184-27.100.

Leonard, Judson S.: *See*—
Wilhelm, Neil C.; and Leonard, Judson S., 4,943,915, Cl. 364-200.000.

Leonard Studio Equipment: *See*—
Chapman, Leonard T., 4,943,101, Cl. 295-8.500.

Lerach, Thomas E.; and Meron, Abraham, to Yamaha Hatsudoki Kabushiki Kaisha. Pedal operated outboard motor for watercraft. 4,943,251, Cl. 440-28.000.

Lessi, Jacques, to Institut Francais du Petrole. Device and method for carrying out operations and/or manipulations in a well. 4,942,926, Cl. 166-385.000.

Levacher, Friedrich K.; Federmann, Helmut; Noack, Georg; and Kraus, Anton, to Felten & Guilleaume Energietechnik AG. Method of continuous measurement of damping in an elongated light wave conductor-sensor having only one accessible end. 4,943,714, Cl. 250-227.160.

Leveque, James H., to AMAF Industries, Inc. Method and apparatus for reducing noise in a linked compressor-expander telecommunications system. 4,944,024, Cl. 455-35.000.

Lever Brothers Company: *See*—
Hefford, Robert J. W.; and Murray, Andrew M., 4,943,430, Cl. 424-70.000.
Norton, Ian T.; and Brown, Charles R. T., 4,943,445, Cl. 426-573.000.

Levy, Gregory D.: *See*—
Lang, Paul W.; and Gribshaw, Franklin C., 4,943,851, Cl. 358-87.000.

Levy, Sheldon L., to Black & Veatch, Engineers-Architects. Reflector assembly. 4,943,325, Cl. 136-259.000.

Levy-Toledano Sylviane: *See*—
Jolles, Pierre; Fiat, Anne-Marie; Soria, Claudine; Levy-Toledano Sylviane; Raha, Sanghamitra; Mazoyer, Elisabeth; and Drouet, Ludovic, 4,943,562, Cl. 514-18.000.

Lewis, Diane M.: *See*—
McGrath, James E.; Yoo, Youngtai; Turner, Robert B.; and Lewis, Diane M., 4,943,626, Cl. 528-408.000.

Lewis, Thomas W.; Hamill, Paul E., Jr.; Ozgu, Mustafa R.; Padfield, Ralph C.; Rego, Donovan N.; and Brita, Guido P. Pressurized tundish for controlling a continuous flow of molten metal. 4,942,986, Cl. 222-590.000.

Lex Computer and Management Corporation: *See*—
Barker, Ronald C.; Schuler, Chester L.; Kiesel, Kenneth C.; and Moxon, Edwin C., 4,943,866, Cl. 358-335.000.

Leybold Aktiengesellschaft: *See*—
Berges, Hanns-Peter, 4,943,215, Cl. 418-9.000.
Dietrich, Walter, 4,943,356, Cl. 204-157.300.
Zejda, Jaroslav; and Schuhmacher, Manfred, 4,943,363, Cl. 204-298.150.

Leyendecker, Joachim: *See*—
Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, 4,943,585, Cl. 514-398.000.
Theobald, Hans; Kuenast, Christoph; Hofmeister, Peter; Neubauer, Hans-Juergen; Kuekenhoehner, Thomas; Krieg, Wolfgang; Leyendecker, Joachim; and Kardorff, Uwe, 4,943,584, Cl. 514-380.000.

Libbey-Owens-Ford Co.: *See*—
Goodman, Ronald D., 4,943,484, Cl. 428-441.000.

Libert, Paul: *See*—
Geyer, Freddy; Henry, Jean P.; and Libert, Paul, 4,943,015, Cl. 244-161.000.

LiCausi, Joseph: *See*—
Kurtz, Leonard D.; and LiCausi, Joseph, 4,943,288, Cl. 604-408.000.

Lidert, Zev, to Rohm and Haas Company. Insecticidal hydrogenated neem extracts. 4,943,434, Cl. 424-195.100.

Liedtke, Kurt: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,942,961, Cl. 206-254.000.
Focke, Heinz; and Liedtke, Kurt, 4,943,271, Cl. 493-24.000.

Life Technology Research Foundation: *See*—
Funakubo, Hiroyasu; Dohi, Takeyoshi; Sakuma, Ichiro; and Komeda, Takashi, 4,943,296, Cl. 606-166.000.

Ligtenberg, Adrianus: *See*—
Bheda, Hemant; and Ligtenberg, Adrianus, 4,943,855, Cl. 358-133.000.

Lii, Wei: *See*—
Lin, Chuan-Sheng; and Lii, Wei, 4,943,077, Cl. 280-260.000.

Lin, Chuan-Sheng; and Lii, Wei, to Yu-Fu Traffic Supplier Ltd., Co. Enclosed single-axle driving mechanism for bicycles. 4,943,077, Cl. 280-260.000.

Lin, Ling-Yung, to New Fei Lien Ent. Co., Ltd. Light illuminated photo frame. 4,942,685, Cl. 40-152.200.

Lin, Whant-Tung. Ignition device for a gas burner. 4,943,232, Cl. 431-263.000.

Lin, Yong-En. Ultra-compact recorder. 4,943,878, Cl. 360-90.000.

Lincoln, Thomas C., to Microdot Inc. Coaxial electrical connector. 4,943,245, Cl. 439-578.000.

Lind, Richard C.: *See*—
Stephens, Ronald R.; Craig, Richard R.; Yen, Huan W.; and Lind, Richard C., 4,943,782, Cl. 330-4.300.

Lindahl, Bengt G.: *See*—
Nilsson, Bengt G.; and Lindahl, Bengt G., 4,943,257, Cl. 453-9.000.

Lindstadt, Klaus: *See*—
Thoma, Klaus; Lindstadt, Klaus; and Rudolf, Karl, 4,942,819, Cl. 102-476.000.

Ling, Hung C., to AT&T Bell Laboratories. Method of making a high density YBa Cu_3O_x superconductor material. 4,943,557, Cl. 505-1.000.

Link, Donald J.; and Stanley, Lonnie D., to Dylist, Inc. Fishing weight. 4,942,689, Cl. 43-42.240.

Linke, Thomas A.; Wilkerson, Alan W.; and Parida, Ashok K., to Buehler Ltd. Precision cutter with automated pressure control. 4,942,795, Cl. 83-72.000.

Linkow, Leonard I.; Rinaldi, Anthony W.; and Gambale, Michael, to Vent-Plant Corporation, Inc. Asymmetrical bone drill. 4,943,236, Cl. 433-165.000.

Linstromberg, William J.; Janke, Donald E.; and Scriber, Chris A., to Whirlpool Corporation. Ice dispensing apparatus. 4,942,979, Cl. 221-75.000.

Lion Corporation: *See*—
Morita, Hiroshi; Hirota, Eiichi; and Ishizaki, Yasuo, 4,943,612, Cl. 524-714.000.

Lippold, Gunther: *See*—
Benz, Paul; and Lippold, Gunther, 4,943,785, Cl. 330-277.000.

Lipson, Melvin A.; Carter, Thomas P.; Shelnut, James G.; and Roos, Leo, to Morton Thiokol, Inc. Photoimageable composition with reduced cold flow due to salt-bridging by metal ions and dry film formed therefrom. 4,943,513, Cl. 430-260.000.

Lischka, Helmut; Gmohling, Werner; and Hieber, Gerd, to SKW Trostberg Aktiengesellschaft. Agent for desulphurizing iron melts, a process for the production thereof and a process for desulphurizing iron melts with the use of said agent. 4,943,317, Cl. 75-312.000.

Lisowsky, Bohdan: *See*—
Edler, James P.; and Lisowsky, Bohdan, 4,943,401, Cl. 264-63.000.

Litigation Innovations, Inc.: *See*—
Jordan, Shelby A.; and Apgar, John W., Sr., 4,943,177, Cl. 402-72.000.

Liu, Ting: *See*—
Lathim, Delbert L.; Liu, Ting; and Foley, Charles F., 4,943,066, Cl. 273-415.000.

Lo, Peter K. C. Wind-drag type climber. 4,943,049, Cl. 272-70.000.

Lockheed Corporation: *See*—
Peppel, George W., 4,943,188, Cl. 405-224.000.

Login, Robert B.: *See*—
Anderson, Lowell R.; Hashem, Mohamed M.; and Login, Robert B., 4,943,664, Cl. 568-623.000.

Logothetis, Eleftherios M.: *See*—
Soltis, Richard E.; Logothetis, Eleftherios M.; and Aslam, Mohammad, 4,943,558, Cl. 505-1.000.

Longo, Robert T.: *See*—
Bardai, Zaher; Rolph, Randy K.; Lamb, Arlene E.; Longo, Robert T.; Manoly, Arthur E.; and Forman, Ralph, 4,943,343, Cl. 156-643.000.

Looker, Brian E., to Glaxo Group Limited. Process for cephem compounds. 4,943,631, Cl. 540-222.000.

Looper, William C. Window lock apparatus. 4,943,096, Cl. 292-213.000.

Loring, Maurice, to Kondex Corporation. Stickle bar joint construction. 4,942,728, Cl. 56-296.000.

Lortz, Allan R.: *See*—
Anthony, James R.; Merrick, David; Homeier, Ronald F.; and Lortz, Allan R., 4,942,649, Cl. 24-637.000.

Lossmann, Gunter: *See*—
Mitschker, Alfred; Lange, Peter M.; Hoffmann, Heiko; Lossmann, Gunter; van der Meer, Andries P.; and Smit, Cornelius J., 4,943,420, Cl. 423-112.000.

Louise, Jean: *See*—
Ledon, Henry; Louise, Jean; and Cocolios, Panayotis, 4,943,422, Cl. 423-242.000.

Lounsberry, Brian D.; and Truszkowska, Krystyna, to General Electric Company. X-ray tube with liquid cooled heat receptor. 4,943,989, Cl. 378-130.000.

Love, Brian J.: *See*—
Gordon, Robert J.; Love, Brian J.; Peterson, Robert K.; and Ozmat, Burhan, 4,943,468, Cl. 428-210.000.

Love, John A.: *See*—
Harwood, Oliver P.; and Love, John A., 4,943,014, Cl. 244-158.00R.

Lovy, Jan: *See*—
Stoy, Vladimir A.; Stoy, George P.; and Lovy, Jan, 4,943,618, Cl. 525-340.000.

Lubrizol Corporation, The: *See*—
Pialet, Joseph W., 4,943,303, Cl. 44-57.000.

Lucas Industries public limited company: *See*—
Kaub, Manfred, 4,942,738, Cl. 60-550.000.

Lucas, Paul: *See*—
Samiotes, Nicholas G.; and Lucas, Paul, 4,943,279, Cl. 604-151.000.

Lucas, Paul B.: *See*—
Masters, Timothy E.; Lucas, Paul B.; Garrett, James E.; and Carstedt, John K., 4,943,806, Cl. 341-31.000.

Luckower, Herbert: *See*—
Nesser, Thomas A.; Nesser, Deborah L.; Luckower, Herbert; Barczak, John P.; Joslyn, Edward P.; and Rick, Bernard J., 4,942,954, Cl. 194-351.000.

Lucot, James B.; and Crampton, George H., to Wright State University. Stimulation of serotonin-1A receptors in mammals to alleviate motion sickness and emesis induced by chemical agents. 4,943,428, Cl. 424-10.000.

Luma Telecom Incorporated: *See*—
Ohtsuka, Hiroshi; and Ueno, Yutaka, 4,943,994, Cl. 379-53.000.

Lumex, Inc.: *See*—
Saloff, William S.; and Saloff, David, 4,942,634, Cl. 5-450.000.

Luminis Pty. Ltd.: *See*—
Shaw, Allan; Luxton, Russell E.; and Luxton, Russell E., 4,942,740, Cl. 62-93.000.

Lund, Earl A. E.: *See*—
Shankland, Ian R.; Richard, Robert G.; and Lund, Earl A. E., 4,943,388, Cl. 252-69.000.

Lund, Theodore A. Downrigger release. 4,942,690, Cl. 43-42.120.

Lundberg, Robert D.: *See*—
Gutierrez, Antonio; and Lundberg, Robert D., 4,943,382, Cl. 252-51.50A.

Lunts, Lawrence H. C.: *See*—
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; and Campbell, Ian B., 4,943,591, Cl. 514-539.000.

Luthy, Christoph, to Hoffmann-La Roche Inc. Heterocyclic compounds. 4,943,583, Cl. 514-364.000.

Luttenberg, Albrecht: *See*—
Patzschke, Hans-Peter; Luttenberg, Albrecht; Schlinsog, Hans-Jurgen; and Bogdan, Wolfgang, 4,943,359, Cl. 204-181.600.

Luxton, Russell E.: *See*—
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Zittel, David R.; and Robbins, Gregory M., 4,942,810, Cl. 99-477.000.

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Lyons, Robert M. Ammunition container. 4,942,991, Cl. 224-196.000.

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Katznelson, Ron D., 4,943,847, Cl. 358-12.000.

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Macaulay, Norman, to Moore Business Forms, Inc. Carbonless copying system and method of producing multiple colored copy images therewith. 4,943,554, Cl. 503-201.000.

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Cho, Soo S., 4,942,624, Cl. 2-16.000.

Macke, Jeffrey D.: *See*—
Field, Lamar; Musallam, Hikmat A.; Macke, Jeffrey D.; and Srivastava, Pramod K., 4,943,657, Cl. 562-125.000.

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Blackburn, Gary R.; Mackerer, Carl R.; and Schreiner, Ceinwen A., 4,943,521, Cl. 435-6.000.

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Yoshino, Hirobumi; Ito, Takashige; Kawase, Junichi; and Maeda, Hiroyuki, 4,944,031, Cl. 355-206.000.
Maeda, Yasutaka; Miyamoto, Tsuyoshi; Ueno, Yukihiko; and Washio, Hiromi, to Sharp Kabushiki Kaisha. Image forming apparatus capable of detecting, analyzing and displaying an originals spectroscopic color data. 4,943,834, Cl. 355-327.000.

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Nabeshima, Takayuki; Matsui, Toru; and Maekawa, Yukio, 4,943,824, Cl. 354-400.000.

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Skrbina, John R.; Polityka, Gregory A.; and Smith, Mark L., 4,943,109, Cl. 296-146.000.

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Richeson, William E.; and Erickson, Frederick L., 4,942,852, Cl. 123-90.140.

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Koski, Richard D.; Kosco, William C.; and Dumais, Arthur, 4,943,773, Cl. 324-207.130.

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Vandnais, Timothy W.; Ekern, Judy M.; and Hennenfent, Douglas J., 4,942,658, Cl. 29-603.000.

Magnus, George; and Kelley, Brian, to Polylactane, Inc. Polyols, use and method of preparation. 4,943,649, Cl. 536-124.000.

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Dom, Harry A.; and Maistros, John A., 4,942,796, Cl. 83-72.000.

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Jacob, Philippe L.; Noujaim, Sharbel E.; Forman, Glenn A.; and Mallick, John A., 4,943,888, Cl. 361-96.000.

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Protter, Andrew A.; Vigne, Jean-Louis; Mallory, Joanne B.; Talmadge, Karen D.; and Kase, John P., 4,943,527, Cl. 435-69.600.

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Vago, Robert E., 4,942,868, Cl. 128-24.00A.

Maloberti, Franco: *See*—
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Bundy, Wayne M.; Manasso, John A.; and Berberich, Joseph P., 4,943,324, Cl. 106-486.000.

Manix, Thomas J. Avalanche flotation ball. 4,943,252, Cl. 441-87.000.

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Nelson, James S.; Angell, Scott L.; Mannerud, Jack E.; and Bergman, Charles H., Jr., 4,943,447, Cl. 427-55.000.

Mannesman Rexroth GmbH: *See*—
Bernd, Hubert; Heiby, Pierre; and Sitter, Alfred, 4,943,212, Cl. 417-7.000.

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Bonifer, Edgar; Duttine, Walter; Jahns, Werner; and Kratz, Helmut, 4,942,957, Cl. 198-781.000.

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Bardai, Zaher; Rolph, Randy K.; Lamb, Arlene E.; Longo, Robert T.; Manoly, Arthur E.; and Forman, Ralph, 4,943,343, Cl. 156-643.000.

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Mark, Karl-Heinz: *See*—
Guttler, Hermann; and Mark, Karl-Heinz, 4,942,729, Cl. 57-261.000.

Markbreiter, Stephen J.; Dessanti, Daniel J.; and Schorr, Hans P., to Kryos Energy Inc.; and Brooklyn Union Gas Company, The. Cogeneration of electricity and liquid carbon dioxide by combustion of methane-rich gas. 4,942,734, Cl. 60-39.020.

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Marlen Research Corporation: *See*—
Schack, Warren R.; and Powers, Richard G., 4,943,442, Cl. 426-513.000.

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Detre, Tamas; Angyan, Sandor; Pap, Laszlo; Szego, Andras; Karadi, Zoltan; Bertus nee Bende, Klara; and Marmarosi nee Kellner, Katalin, 4,943,307, Cl. 71-3.000.

Martin Marietta Magnesia Specialties Inc.: *See*—
Nagle, Dennis C.; and Van de Walle, Richard H., 4,943,301, Cl. 23-313.00R.

Martinez, Eloy C., to Dow Chemical Company, The. Reinforced polymer compositions having excellent distinctness of image. 4,943,603, Cl. 523-220.000.

Marttila, Erik A. Belt-drive conveyor system for refuse. 4,942,958, Cl. 198-833.000.

Masaki, Hiroya: *See*—
Takahashi, Jiro; Tsuzita, Kenzi; Takagiwa, Hiroyuki; Shigeta, Kunio; and Masaki, Hiroya, 4,943,507, Cl. 430-120.000.

Masamoto, Kazuhisa: *See*—
Goto, Yukihisa; Masamoto, Kazuhisa; Yagihara, Hiroshi; Morishima, Yasuo; and Osabe, Hirokazu, 4,943,314, Cl. 71-94.000.

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Erni, Markus, 4,944,033, Cl. 364-470.000.

Masco Corporation: *See*—
Knapp, Alfons, 4,942,902, Cl. 137-625.170.

Massachusetts Institute of Technology: *See*—
Gevelber, Michael A.; and Patera, Anthony T., 4,943,160, Cl. 356-372.000.
Haritonidis, Joseph H.; Senturia, Stephen D.; Warkentin, David J.; and Mehregany, Mehran, 4,942,767, Cl. 73-705.000.
Howe, Roger T.; Lang, Jeffrey H.; Schlecht, Martin F.; Schmidt, Martin A.; and Senturia, Stephen D., 4,943,750, Cl. 310-309.000.
Micali, Silvio; and Schnorr, Claus, 4,944,009, Cl. 380-46.000.

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Sakui, Koji; Fuse, Tsuneaki; and Masuoka, Fujio, 4,943,944, Cl. 365-189.050.

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Hatch, Frederick R.; Riley, William M.; and Banks, Thomas M., 4,943,068, Cl. 277-23.000.

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Hayashi, Fusashi; Takei, Kooichi; Matii, Yooichi; Simazaki, Toshikatsu; Imai, Akihito; and Nakada, Takao, 4,943,542, Cl. 501-12.000.

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Kitada, Akira; Yamazaki, Kikuo; Matsuda, Terumi; and Kawagoe, Jun, 4,943,727, Cl. 250-483.100.

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Nabeshima, Takayuki; Matsui, Toru; and Maekawa, Yukio, 4,943,824, Cl. 354-400.000.

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Watanabe, Mitsugu; Kaneko, Kazuhiko; and Matsumoto, Etsuji, 4,943,241, Cl. 439-34.000.

Matsumoto, Mitsujiro: *See*—
Kageyama, Sadashi; Abe, Yoshio; Yasumoto, Yoshio; Inoue, Shuji; Takai, Hitoshi; Matsumoto, Mitsujiro; Aono, Kouji; Uchimura, Kiyoshi; and Eiji, Iwasaki, 4,944,032, Cl. 358-12.000.

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Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,943,916, Cl. 364-200.000.

Matsunaka, Kazuhisa: *See*—
Sasaki, Noriaki; and Matsunaka, Kazuhisa, 4,943,395, Cl. 252-629.000.

Matsuo, Hirofumi: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 4,944,030, Cl. 354-403.000.

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Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,943,916, Cl. 364-200.000.
Hayashi, Nobuhiro; Tanaka, Toshiichiro; Yamaguchi, Seiji; and Imai, Hidetoshi, 4,942,640, Cl. 15-319.000.
Kageyama, Sadashi; Abe, Yoshio; Yasumoto, Yoshio; Inoue, Shuji; Takai, Hitoshi; Matsumoto, Mitsujiro; Aono, Kouji; Uchimura, Kiyoshi; and Eiji, Iwasaki, 4,944,032, Cl. 358-12.000.
Kitaura, Hiromu; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, 4,943,858, Cl. 358-167.000.
Miyatake, Yoshito; and Masumoto, Yoshihiro, 4,943,154, Cl. 353-31.000.
Tsuchiya, Sohji; Kudoh, Yasuo; Kojima, Toshikuni; Fukuyama, Masao; and Yoshimura, Susumu, 4,943,892, Cl. 361-525.000.

Matsushita Electric Works, Ltd.: *See*—
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, 4,942,884, Cl. 128-804.000.

Matsushita, Mitsuo: *See*—
Sasaki, Kenji; Matsushita, Mitsuo; Ono, Kenzo; Horiwaki, Akihiro; Fujii, Katsunori; and Hatano, Hiroyuki, 4,943,829, Cl. 355-215.000.

Matsuura, Kiyoshi: *See*—
Kambe, Koichi; Matsuura, Kiyoshi; Seino, Tatsuo; Kimura, Yoshiyuki; Kemmochi, Hiroshi; Yoshioka, Koichi; and Hohnoki, Hideaki, 4,943,418, Cl. 423-50.000.

Matsuura, Tadashi: *See*—
Takada, Hiromi; Suzuki, Takami; Shiina, Toshio; Okamoto, Keiji; Komurasaki, Takeshi; Yoshioka, Satoru; Sakuma, Nobuo; and Matsuura, Tadashi, 4,943,128, Cl. 350-6.900.

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Nojima, Hideo; Kojima, Yoshimi; Imada, Eiji; Matsuyama, Toshiro; Hayakawa, Takashi; Narikawa, Shiro; and Ehara, Shaw, 4,943,503, Cl. 430-66.000.

Matsuzawa, Yumi: *See*—
Kinoshita, Akira; Matsuzawa, Yumi; and Yoshizawa, Hideo, 4,943,501, Cl. 430-58.000.

Matteau, Paul P.: *See*—
Seifert, Gunilla K. E.; and Matteau, Paul P., 4,942,770, Cl. 73-864.340.

Mattei, Riccardo, to G. D. Societa Per Azioni. Device with contrarotating knives for severing filter cigarette uniting bands from webs in automatic filter tipping machines. 4,943,341, Cl. 156-517.000.

Mattelin, Antoon, to Siemens Aktiengesellschaft. Method for manufacturing printed circuit boards. 4,943,346, Cl. 156-651.000.

Matthews, M. Dean: *See*—
Pechnik, Alexander; and Matthews, M. Dean, 4,943,320, Cl. 75-235.000.

Matthews, Robert: *See*—
Davis, Cecil J.; and Matthews, Robert, 4,943,457, Cl. 428-35.200.

Matthews, Thomas R.: *See*—
Crews, Phillip; Matthews, Thomas R.; and Horton, Paul, 4,943,589, Cl. 514-468.000.

Matthys, Robert J.: *See*—
Aagardl, Roger L.; Bonne, Ulrich; and Matthys, Robert J., 4,944,035, Cl. 364-556.000.

Mattison, Richard C.: *See*—
Euteneuer, Charles L.; Mattison, Richard C.; Adams, Daniel O.; Hektner, Thomas R.; and Keith, Peter T., 4,943,278, Cl. 604-96.000.

Mattox, Robert J.: *See*—
Wilson, Syd R.; Sellers, James A.; and Mattox, Robert J., 4,943,539, Cl. 437-195.000.

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Maury, Bernard: *See*—
Cognasse, Christian; Graham, Peter; Maury, Bernard; and Walter, Jean-Claude, 4,944,017, Cl. 381-79.000.

May, James G.: *See*—
Edwards, M. Earl; and May, James G., 4,943,200, Cl. 414-332.000.

May, Sharon B.: *See*—
Stern, Joseph A.; Green, Stephen L.; King, Charles B.; and May, Sharon B., 4,942,626, Cl. 2-161.00R.

Mazda Motor Corporation: *See*—
Hamamoto, Masaya; and Shibata, Keiichiro, 4,943,102, Cl. 296-96.210.
Kijima, Takao; Edahiro, Takeshi; Koyama, Toshihide; and Taniguchi, Haruyuki, 4,943,082, Cl. 280-673.000.

Mazoyer, Elisabeth: *See*—
Jolles, Pierre; Fiat, Anne-Marie; Soria, Claudine; Levy-Toledano Sylviane; Raha, Sanghamitra; Mazoyer, Elisabeth; and Drouet, Ludovic, 4,943,562, Cl. 514-18.000.

McBride, Larry J.: *See*—
Thomas, Henry A.; and McBride, Larry J., 4,942,633, Cl. 5-11.000.

McCabe, Edward M., to Nestec S.A. Method of producing simulated meat product from whole soybeans. 4,943,441, Cl. 426-511.000.

McCabe, Patrick J.: *See*—
Ingersoll, Clyde E.; Schaffer, Stephen P.; and McCabe, Patrick J., 4,943,483, Cl. 428-433.000.

McCabe, Stanley G., to Jensen Corporation. Apparatus for separating laundry articles. 4,943,198, Cl. 414-13.000.

McClelland, Ralph A.: *See*—
Hancock, John P.; and McClelland, Ralph A., 4,942,741, Cl. 62-292.000.

McCord, Wilfred M., Jr.: *See*—
Gakhar, Ved P.; Dossett, Richard A.; and McCord, Wilfred M., Jr., 4,942,912, Cl. 144-136.00C.

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Ashley-Rollman, Charles; O'Donnell, Miles C.; and McCormick, William, 4,943,770, Cl. 324-207.170.

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McCullough, Timothy J. Meat trimming knife and drive system therefore. 4,942,665, Cl. 30-276.000.

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Mohsen, Amr M.; Hamdy, Esmat Z.; and McCullum, John L., 4,943,538, Cl. 437-52.000.

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Hlavacek, Robert A.; Dumican, Barry L.; and McCusker, Edward J., 4,942,875, Cl. 606-230.000.

McDonald, Ian A.: *See*—
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McDowell, Alexander W. K., to Ellicott Machine Corporation. Dredging module for use with conventional back hoe apparatus. 4,942,682, Cl. 37-66.000.

McFarland, Andrew R., to Texas A & M University System, The. Anisokinetic shrouded aerosol sampling probe. 4,942,774, Cl. 73-864.810.

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McGhie, James R.; and Dieleman, Robert D. Heavy duty transport vehicle. 4,943,078, Cl. 280-408.000.

McGough, Gerald B., to Palco Telecom Inc. Security mechanism for telephone paystations. 4,942,748, Cl. 70-389.000.

McGrath, James E.; Yoo, Youngtai; Turner, Robert B.; and Lewis, Diane M., to Dow Chemical Company, The. Primary polyether active hydrogen compounds which are prepared from linked, protectively initiated polyalkyleneoxides. 4,943,626, Cl. 528-408.000.

McGuckin, James P.; Bradfield, Dean L.; Foltz, Raymond A.; and Heidt, H. James. Combined drainage and waterproofing panel system for subterranean walls. 4,943,185, Cl. 405-45.000.

McMullin, Francis: *See*—
Byrne, John V.; McMullin, Francis; Devitt, Francis; O'Dwyer, Jeremiah; Murphy, John; Egan, Michael; Brosnan, Michael; and Lawton, James, 4,943,760, Cl. 318-701.000.

McRae, John L. Paving material testing machine. 4,942,768, Cl. 73-795.000.

McRight, William C., to Spectra-Physics, Inc. Multi-faceted optical device for laser scanner. 4,943,127, Cl. 350-6.800.

Mead Corporation, The: *See—*
Good, William G.; and Holycross, Mark E., 4,943,827, Cl. 355-30.000.

Meanwell, Nicholas A., to Bristol-Myers Squibb Company. Imidazo[4,5-b]quinolinyloxyalkanoic acid amides with enhanced water solubility. 4,943,573, Cl. 514-253.000.

Measurex Corporation: *See—*
Vidrine, Warren D., Jr., 4,943,721, Cl. 250-308.000.

Mecadon, Linda. Slip. 4,942,625, Cl. 2-73.000.

Medcalf, Ralph F., Jr.: *See—*
Hastedt, Charlene M.; Medcalf, Ralph F., Jr.; and Otten, Geneva G., 4,943,392, Cl. 252-539.000.

Medev Corporation: *See—*
Stern, Joseph A.; Green, Stephen L.; King, Charles B.; and May, Sharon B., 4,942,626, Cl. 2-161.00R.

Medney, Jonas; and Klimpl, Fred E., to Compositech Ltd. Method for making reinforced plastic laminates for use in the production of circuit boards. 4,943,334, Cl. 156-174.000.

Meeker, Paul K., to Spalding & Evenflo Companies, Inc. Child restraint system with improved base. 4,943,113, Cl. 297-250.000.

Megy, Joseph A. Process for recovering alkali metal titanium fluoride salts from titanium pickle acid baths. 4,943,419, Cl. 423-72.000.

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Haritonidis, Joseph H.; Senturia, Stephen D.; Warkentin, David J.; and Mehregany, Mehran, 4,942,767, Cl. 73-705.000.

Meindl, Bernd, to Konrad Doppelmayr & Sohn Maschinenfabrik Gesellschaft m.b.H. & Co. KG. Cable conveyance. 4,942,823, Cl. 104-178.000.

Meisburger, William D.: *See—*
Golladay, Steven D.; Hohn, Fritz J.; Hutson, David J.; Meisburger, William D.; and Rasch, Juergen, 4,943,769, Cl. 324-158.00R.

Melling, Raymond J.; and Knight, Malcolm R. M., to Portals Limited. Security paper for bank notes and the like. 4,943,093, Cl. 283-83.000.

Membrane Technology & Research, Inc.: *See—*
Baker, Richard W.; and Shrock, Paul, 4,943,475, Cl. 428-246.000.

Mendelsohn, John; Kawamoto, Tomoyuki; Sato, Gordon; and Sato, J. Denry, to University of California, The Regents of the. Hybrid cell lines that produce monoclonal antibodies to epidermal growth factor receptor. 4,943,533, Cl. 435-240.270.

Mengel, Keith E., to Eaton Corporation. Hardfacing powders. 4,943,698, Cl. 219-121.470.

Mens, Wilhelmus R. M.: *See—*
Boskamp, Eddy B.; and Mens, Wilhelmus R. M., 4,943,775, Cl. 324-322.000.

Menyhart, Alexander F.: *See—*
Winthrop, John T.; Menyhart, Alexander F.; and Duszlak, James, 4,942,696, Cl. 51-277.000.

Merck & Co., Inc.: *See—*
Halczenko, Wasyl; Pitzenberger, Steven M.; and Hartman, George, 4,943,588, Cl. 514-452.000.
Heimbrook, David C.; Riemen, Mark W.; Oliff, Allen; and Saari, Walfred S., 4,943,561, Cl. 514-17.000.

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Sucrow, Wolfgang; Wolter, Herbert; and Eidenschink, Rudolf, 4,943,384, Cl. 252-299.610.

Merlin Gerin: *See—*
Mertz, Jean-Luc; Guerin, Hubert; Perrot, Michel; and De Robertis, Patrick, 4,943,691, Cl. 200-151.000.

Meron, Abraham: *See—*
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Merrell Dow Pharmaceuticals Inc.: *See—*
Palfreyman, Michael G.; McDonald, Ian A.; and Bey, Philippe, 4,943,593, Cl. 514-649.000.

Merrick, David: *See—*
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Merrill, Leo: *See—*
Sung, Chien-Min; Chen, Sy-Hwa; Merrill, Leo; and Bigelow, Louis K., 4,943,488, Cl. 428-552.000.

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Metritape, Inc.: *See—*
Dews, Edwin P.; Pierce, William E.; Gunnarson, John A.; and Ehrenfried, Albert D., 4,942,764, Cl. 73-301.000.

Metzger, Karl G.: *See—*
Boberg, Michael; Angerbauer, Rolf; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,943,568, Cl. 514-206.000.

Meyer, Friedhelm: *See—*
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Meyer, Helmut: *See—*
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Meyer, John J., to Nooter Corporation. Tube-type vessel having crevice-free joints and method for manufacturing the same. 4,943,001, Cl. 228-173.400.

Meyer, Rolf-Volker: *See—*
Ebert, Wolfgang; Meyer, Rolf-Volker; and Kreuder, Hans-Joachim, 4,943,623, Cl. 528-272.000.

Meyer, Stephen T., to Deflecto Corporation. Printed material support holder. 4,943,024, Cl. 248-316.700.

Meyerhoefer, Carl; Neuwirth, Helmuth; and Visconti, Peter, to Porta Systems Corp. Solid state telephone protector module. 4,944,003, Cl. 379-412.000.

Micali, Silvio; and Schnorr, Claus, to Massachusetts Institute of Technology. Pseudo-random sequence generator. 4,944,009, Cl. 380-46.000.

Michaelis, Walfried; and Weitkamp, Claus, to GKSS Forschungszentrum Geesthacht GmbH. Method and apparatus for the detection of hydrocarbons dissolved in bodies of water. 4,943,161, Cl. 356-437.000.

Micrion Corporation: *See—*
Economou, Nicholas P., 4,943,732, Cl. 250-572.000.

Micro-Trak Systems, Inc.: *See—*
Hiniker, Thomas K.; and Tofte, Semor D., 4,942,765, Cl. 73-431.000.

Microdot Inc.: *See—*
Lincoln, Thomas C., 4,943,245, Cl. 439-578.000.

Micron Technology, Inc.: *See—*
Mondragon, Carl W.; and Sperry, David A., 4,943,148, Cl. 350-529.000.

Microsonics, Inc.: *See—*
Leavell, David R.; Spencer, Earl W., Jr.; and Bacon, Bruce L., 4,943,951, Cl. 367-111.000.

Mif-Sud Industries, Inc.: *See—*
Murphy, Patrick M., 4,943,181, Cl. 403-324.000.

Mihara, Toshihide; and Odan, Yuji, to Kanzaki Kokyukoki Mfg. Co. Ltd. Automatic cutter change type shaving machine. 4,942,657, Cl. 29-568.000.

Miles Inc.: *See—*
Carmen, Raleigh A., 4,943,287, Cl. 604-408.000.

Miller, Clarence W. J.: *See—*
McGarry, Charles N.; Miller, Clarence W. J.; and Wehrenberg, Thomas M., 4,943,544, Cl. 501-124.000.

Miller, Kenneth L., to SCM Metal Products, Inc. Dripless solder paste dispenser. 4,942,984, Cl. 222-309.000.

Miller, Kevin W., to Jupiter Products, Inc. Device for carrying lumber and the like. 4,942,989, Cl. 224-42.45R.

Miller, Stephen J., to Chevron Research Company. Synthesis of a crystalline silicoaluminophosphate. 4,943,424, Cl. 423-328.000.

Milliken Denmark A/S: *See—*
Lang, Aage, 4,943,070, Cl. 277-235.00R.

Millsapps, Stuart C., Jr., to Cummins Engine Company, Inc. Lubrication system for an earth boring drill bit and methods for filling and retrofit installing thereof. 4,942,930, Cl. 175-228.000.

Minami, Shuji: *See—*
Kinoshita, Tatsuo; Minami, Shuji; Mizui, Kinya; and Kaneshige, Ryousuke, 4,943,658, Cl. 562-572.200.

Minchak, Robert J.: *See—*
Janda, Dennis J.; Stricharczuk, Paul T.; and Minchak, Robert J., 4,943,621, Cl. 526-127.000.

Mine Safety Appliances Company: *See—*
Freund, Paul X., 4,942,628, Cl. 2-416.000.

Minnesota Mining and Manufacturing Company: *See—*
Bacon, Chester A., Jr.; and Coderre, James C., 4,943,139, Cl. 350-105.000.
Brown, David E.; and Leichter, Louis M., 4,943,638, Cl. 548-455.000.
Bryan, Thomas T., 4,943,237, Cl. 433-213.000.
Karim, Naimul, 4,943,461, Cl. 428-40.000.
Muehlhausen, Robert A.; and Fairchild, John F., 4,943,880, Cl. 360-133.000.
Powers, Stephen R.; Finn, Peter J.; and Fisher, Michael G., 4,943,517, Cl. 430-301.000.
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Minoda, Takeshi: *See—*
Todo, Akira; Kimura, Toshio; Minoda, Takeshi; and Kurisu, Masayoshi, 4,943,611, Cl. 524-493.000.

Minolta Camera Kabushiki Kaisha: *See—*
Demizu, Ichiro; Nakamura, Mitsutoshi; and Kohri, Toshitaro, 4,943,506, Cl. 430-109.000.
Emori, Kiyoshi, 4,943,832, Cl. 355-313.000.
Fukushima, Shigenobu, 4,943,833, Cl. 355-326.000.
Hotomi, Hideo, 4,943,818, Cl. 346-140.00R.
Nabeshima, Takayuki; Matsui, Toru; and Maekawa, Yukio, 4,943,824, Cl. 354-400.000.
Sakai, Takao; and Hamaguri, Kenji, 4,942,877, Cl. 128-633.000.
Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, 4,943,825, Cl. 354-481.000.
Yokoyama, Takayuki; and Kyoden, Yasuhiro, 4,943,812, Cl. 346-1.100.

Mishra, Munmaya K.; and Osman, Akhtar, to Polysar Limited. Living cationic polymerization process. 4,943,616, Cl. 525-264.000.

Miskewitz, Regina M.: *See—*
Winston, Anthony F.; and Miskewitz, Regina M., 4,943,429, Cl. 424-52.000.

Mistyurik, John D.: *See—*
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Mita Industrial Co., Ltd.: *See—*
Sasaki, Kenji; Matsushita, Mitsuo; Ono, Kenzo; Horiwaki, Akihiro; Fujii, Katsunori; and Hatano, Hiroyuki, 4,943,829, Cl. 355-215.000.

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Mitschker, Alfred; Lange, Peter M.; Hoffmann, Heiko; Lossmann, Gunter; van der Meer, Andries P.; and Smit, Cornelius J., to Bayer Aktiengesellschaft; and Ingal International Gallium GmbH. Process for recovering gallium. 4,943,420, Cl. 423-112.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,943,916, Cl. 364-200.000.
Ikeuchi, Masayuki; and Okamura, Kouichi, 4,943,717, Cl. 250-231.170.
Komatsu, Takahiro; Kumanoya, Masaki; Dosaka, Katsumi; and Konishi, Yasuhiro, 4,943,960, Cl. 365-222.000.
Machida, Hirohisa; and Nakabayashi, Takeo, 4,943,965, Cl. 371-36.000.
Matsuo, Noriaki, 4,943,859, Cl. 358-172.000.
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Niki, Kenichi; Kokogawa, Tohru; Ishizu, Akira; and Takasago, Hayato, 4,943,768, Cl. 324-158.00F.
Ohtsuka, Hiroshi; and Ueno, Yutaka, 4,943,994, Cl. 379-53.000.
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Toshiyasu, Masayuki; Chihara, Kazuhiro; and Iwasaki, Yasuo, 4,943,755, Cl. 315-8.000.
Uesaka, Kazuo; Yamada, Akira; Teramoto, Kazuyoshi; Nishiyama, Ituo; and Haraga, Kousuke, 4,943,862, Cl. 358-245.000.
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Mitsubishi Gas Chemical Company, Inc.: *See*—
Tanisake, Hiroka; Okumura, Hiroyuki; Namikawa, Akira; Ishikawa, Masato; and Abe, Toshiaki, 4,943,607, Cl. 523-500.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Hiramatsu, Takeo; Ozaki, Tetsuo; and Fujita, Kenjiro, 4,943,920, Cl. 364-424.100.
Sakurai, Hiromi, 4,942,659, Cl. 29-705.000.
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Mitsubishi Rayon Co., Ltd.: *See*—
Kanamura, Tomotsugu; Shibata, Toshihiko; and Inoue, Yasuji, 4,943,477, Cl. 428-286.000.
Mitsudo, Makoto: *See*—
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Mitsugi, Kouichi: *See*—
Okada, Hideo; Mori, Toshikatsu; Mitsugi, Kouichi; Iwase, Yoshio; Kuroe, Satoshi; Takeuchi, Masato; and Kamo, Tomoichi, 4,943,496, Cl. 429-45.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Kinoshita, Tatsuo; Minami, Shuji; Mizui, Kinya; and Kaneshige, Ryousuke, 4,943,658, Cl. 562-572.200.
Nishiyama, Shinichi; Yamaoka, Hideo; Yamanaka, Tooru; and Yamada, Tohru, 4,943,651, Cl. 560-56.000.
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Ezawa, Hiroshi; Nakakura, Toshiyuki; Watanabe, Takayuki; and Tsushima, Hiroaki, 4,943,594, Cl. 521-79.000.
Mitsuku Denshi Kogyo Kabushiki Kaisha: *See*—
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Mitsutsuka, Syuichi, to Clarion Co., Ltd. Surface acoustic wave element. 4,943,751, Cl. 310-313.00D.
Mitutoyo Corporation: *See*—
Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, 4,943,716, Cl. 250-231.160.
Miura, Hiroki: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,943,916, Cl. 364-200.000.
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Miyagawa, Ichirou, to Fuji Photo Film Co., Ltd. Image read-out and reproducing apparatus. 4,943,871, Cl. 358-496.000.
Miyake, Ichiro: *See*—
Hatanaka, Yuji; Okamoto, Hiroo; Wakumura, Shin-ichi; Miyake, Ichiro; and Sakamoto, Shunichiro, 4,943,964, Cl. 371-31.000.
Miyake, Junichi: *See*—
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Miyamoto, Hironori; Kondo, Hidefumi; Haga, Hirohide; and Takashi, Rinichi, to Hitachi, Ltd. Method for translating data base to knowledge and apparatus therefor. 4,943,933, Cl. 364-513.000.
Miyamoto, Junichi: *See*—
Imamiya, Keniti; Tanaka, Sumio; Miyamoto, Junichi; Atsumi, Shigeru; Ohtsuka, Nobuaki; and Saito, Shinji, 4,943,962, Cl. 365-230.080.
Miyamoto, Masanori, to Delta Kogyo Co., Ltd. Apparatus for assembling a seat for use in an automobile. 4,942,651, Cl. 29-91.500.
Miyamoto, Tsuyochi: *See*—
Maeda, Yasutaka; Miyamoto, Tsuyochi; Ueno, Yukihiko; and Washio, Hiromi, 4,943,834, Cl. 355-327.000.
Miyashita, Tsuneo; Nishio, Hiroaki; and Sato, Michitaka, to Nippon Kokan Kabushiki Kaisha. Method for molding a pulverulent material. 4,943,403, Cl. 264-233.000.
Miyata, Kenji: *See*—
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Miyata, Muneyoshi, to Mitsuku Denshi Kogyo Kabushiki Kaisha. Cover integrated leaf switch. 4,943,692, Cl. 200-283.000.
Miyata, Seizo, to Canon Kabushiki Kaisha; and Miyata, Seizo. Display method and apparatus. 4,943,145, Cl. 350-354.000.
Miyata, Souichi: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,943,916, Cl. 364-200.000.
Miyatake, Yoshito; and Masumoto, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Projection display apparatus. 4,943,154, Cl. 353-31.000.
Miyazaki, Masayuki: *See*—
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Miyazaki, Nobuyuki; Unoki, Masao; and Munekata, Seiji, to Asahi Glass Company Ltd. Coating composition. 4,943,614, Cl. 525-117.000.
Miyazaki, Shuji: *See*—
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Miyazaki, Yasumitsu: *See*—
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Miyazawa, Kazutoshi: *See*—
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Mizoguchi, Shuri: *See*—
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Mizoguchi, Yasunari: *See*—
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Kinoshita, Tatsuo; Minami, Shuji; Mizui, Kinya; and Kaneshige, Ryousuke, 4,943,658, Cl. 562-572.200.
Mizuno, Shigeki; Ueda, Takaharu; Yamamoto, Tetsu; and Yumura, Takashi. Chopping secondary mirror system. 4,943,147, Cl. 350-486.000.
Mizunuma, Satoshi: *See*—
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MOBA - Electronic: *See*—
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Mobay Corporation: *See*—
Jackman, Dennis E.; Combs, Gary W.; and Westphal, Dietmar B., 4,943,660, Cl. 564-18.000.
Mobil Oil Corporation: *See*—
Avery, Noyes L.; Horodysky, Andrew G.; Law, Derek A.; and Rudnick, Leslie R., 4,943,383, Cl. 252-52.00A.
Blackburn, Gary R.; Mackerer, Carl R.; and Schreiner, Ceinwen A., 4,943,521, Cl. 435-6.000.
Chang, Clarence D.; Han, Scott; and Pelrine, Bruce P., 4,943,545, Cl. 502-56.000.
Fischer, Ronald H.; LaPierre, Rene B.; Owens, Peter J.; and Varghese, Philip, 4,943,366, Cl. 208-68.000.
Provan, Alexander R.; and Vanderlee, David G., 4,943,207, Cl. 414-797.700.
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Mohsen, Amr M.; Hamdy, Esmat Z.; and McCullum, John L., to Actel Corporation Programmable low impedance anti-fuse element. 4,943,538, Cl. 437-52.000.
Molex Incorporated: *See*—
Colleran, Stephen A.; Gugelmeyer, Robert J.; and Wilson, Bill B., 4,943,248, Cl. 439-850.000.
Teck, Yap Y.; Wah, Lim T.; Geok, Anna T. K.; and Weng, Chan H., 4,943,244, Cl. 439-567.000.
Monarch Marking Systems, Inc.: *See*—
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Monbaliu, Marcel J.: *See*—
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Moncorge, Jean-Paul: *See*—
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Mondragon, Carl W.; and Sperry, David A., to Micron Technology, Inc. Silicon wafer holder. 4,943,148, Cl. 350-529.000.
Monkewitz, Martin; and Oppliger, Erich, to Schweizerische Eidgenossenschaft. Method of and device for accelerating test pieces on a circular path. 4,942,775, Cl. 73-865.300.
Monroe Auto Equipment Company: *See*—
Groves, Gary W.; and Perry, David L., 4,943,083, Cl. 280-707.000.
Monroy, Jacob G. Anti-theft auto locking device with spring clutch. 4,942,746, Cl. 70-238.000.
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Coleman, James P.; Graham, Charles R.; and Monzyk, Bruce F., 4,943,646, Cl. 556-1.000.
Woodard, Floyd E.; and Zeable, Zane V., 4,943,140, Cl. 350-164.000.
Montedison S.p.A.: *See*—
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Monti, Fabio: *See*—
Eaton, Philip; Nodari, Nereo; Neri, Carlo; Cassar, Luigi; Monti, Fabio; and Alberici, Fausto, 4,943,302, Cl. 44-56.000.
Montoya, Maria T.; Norman, Alan B.; Sanders, Norman C., Jr.; and Creamer, Glenn E., to R. J. Reynolds Tobacco Company. Cigarette. 4,942,888, Cl. 131-359.000.
Monzyk, Bruce F.: *See*—
Coleman, James P.; Graham, Charles R.; and Monzyk, Bruce F., 4,943,646, Cl. 556-1.000.
Moore Business Forms, Inc.: *See*—
Macaulay, Norman, 4,943,554, Cl. 503-201.000.
Moreau, Claude R. M. Convertible comestible. 4,943,063, Cl. 273-157.00R.
Morell, Joseph, to Salomon, S.A. Golf club having removable head. 4,943,059, Cl. 273-80.100.
Mori, Hajime: *See*—
Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ara, Katsutoshi; Ito, Susumu; and Okamoto, Kikuhiko, 4,943,532, Cl. 435-209.000.
Mori, Kei. Combination of optical connectors and optical terminal covers. 4,943,138, Cl. 350-96.200.
Mori, Kei. Solar ray collecting device. 4,943,141, Cl. 350-258.000.
Mori, Masaharu: *See*—
Kurihara, Takao; Hamatsu, Masahiro; and Mori, Masaharu, 4,943,975, Cl. 375-1.000.
Mori, Seiichi, to Kabushiki Kaisha Toshiba. Ultraviolet erasable non-volatile semiconductor device. 4,943,836, Cl. 357-23.500.
Mori, Susumu; and Shibuya, Masato, to Nikon Corporation. Projection optical apparatus capable of measurement and compensation of distortion affecting reticle/wafer alignment. 4,943,733, Cl. 250-548.000.
Mori, Toshikatsu: *See*—
Okada, Hideo; Mori, Toshikatsu; Mitsugi, Kouichi; Iwase, Yoshio; Kuroe, Satoshi; Takeuchi, Masato; and Kamo, Tomoichi, 4,943,496, Cl. 429-45.000.
Moriarty, Kevin J., to Deere & Company. Belted crawler having auxiliary drive wheel. 4,942,934, Cl. 180-6.480.
Moriguchi, Kouji: *See*—
Sugita, Naomasa; Yotsmoto, Yoshiharu; Moriguchi, Kouji; and Sekiba, Toshinobu, 4,943,842, Cl. 357-51.000.
Morihashi, Toshifumi; Sakai, Shoji; Nakayama, Teruo; Noda, Koshi; and Fujiwara, Michiaki, to Murata Kikai Kabushiki Kaisha. Spinning method and spinning apparatus. 4,942,731, Cl. 57-328.000.
Morikawa, Asao: *See*—
Shiromizu, Hisaharu; Morikawa, Asao; Sukegawa, Tsuneyuki; and Kondo, Kazuo, 4,943,470, Cl. 428-209.000.
Morikawa, Koji, to Fuji Jukogyo Kabushiki Kaisha. Safety system for an automotive engine. 4,942,859, Cl. 123-198.00D.
Morikawa, Kunihiko: *See*—
Sugimoto, Masaki; Morikawa, Kunihiko; Hitomi, Nobuteru; Ikeura, Kenji; Kitahara, Hisashi; Hirano, Hiroyuki; and Takatori, Kazuhiro, 4,942,771, Cl. 73-862.360.
Morimoto, Yoshihiko, to Fuji Jukogyo Kabushiki Kaisha. Transmission ration control system for a continuously variable transmission. 4,942,783, Cl. 74-866.000.
Morio, Tomokazu; Fujimoto, Yoshiji; and Kitoh, Atsunori, to Sharp Kabushiki Kaisha. Speech analyzing and synthesizing apparatus utilizing differential value-based variable code length coding and compression of soundless portions. 4,944,012, Cl. 381-30.000.
Morisawa, Tahei, to Asahi Kogaku Kogyo Kabushiki Kaisha. TV viewer. 4,943,853, Cl. 358-102.000.
Morishima, Yasuo: *See*—
Goto, Yukihisa; Masamoto, Kazuhisa; Yagihara, Hiroshi; Morishima, Yasuo; and Osabe, Hirokazu, 4,943,314, Cl. 71-94.000.
Morita, Hiroshi; Hirota, Eiichi; and Ishizaki, Yasuo, to Lion Corporation. Ultra-fine particulated polymer latex and composition containing the same. 4,943,612, Cl. 524-714.000.
Morita, Kazuhiko: *See*—
Yamada, Yasuyuki; Nagao, Matoko; and Morita, Kazuhiko, 4,943,479, Cl. 428-331.000.
Morita, Shigeru; and Oka, Masahiko, to Daikin Industries Ltd. Novel fluorine-containing acrylic acid derivative and polymer thereof. 4,943,653, Cl. 560-219.000.
Morley, Robert S.; and Carew, Edward C., to Northern Telecom Limited. Interface circuit with transient event tolerance. 4,944,004, Cl. 379-412.000.
Moro, Yutaka: *See*—
Yarita, Takao; Moro, Yutaka; Takeishi, Kazuvasu; and Ohashi, Shinichi, 4,943,927, Cl. 364-470.000.
Moroto, Shuzo; Sumiya, Koji; Yokoyama, Shouji; Nimura, Mitsuhiro; and Nanba, Akimasa, to Aisin AW Co., Ltd. Navigation apparatus based on present position calculating system. 4,943,925, Cl. 364-449.000.
Morris, Peter C.: *See*—
Palmer, Donald J.; and Morris, Peter C., 4,943,813, Cl. 346-1.100.
Morrison, William A., to James Mackie & Sons Limited. Textile apparatus. 4,942,730, Cl. 57-303.000.
Morton, Bruce L.; Eagles, Bruce E.; and Chaddock, Michael H., to Motorola, Inc. Program check for a non-volatile memory. 4,943,948, Cl. 365-201.000.
Morton Thiokol, Inc.: *See*—
Cunningham, Donald J., 4,943,086, Cl. 280-741.000.
Lazarus, Richard M.; Reardon, Edward J.; and Dixit, Sunit S., 4,943,511, Cl. 430-192.000.
Lipson, Melvin A.; Carter, Thomas P.; Shelnut, James G.; and Roos, Leo, 4,943,513, Cl. 430-260.000.
Mosby, Richard A. Contoured imaging system. 4,943,991, Cl. 378-182.000.
Moser, Bernhard, to Hawera Probst GmbH & Co. Drilling tool having frictionally rotatable drilling head. 4,942,931, Cl. 175-323.000.
Motamedi, Masoud, to Geostar Corporation. Detection of burst signal transmissions. 4,943,974, Cl. 375-1.000.
Motoda, Takashi: *See*—
Yanagawa, Masahiro; Abe, Mutsumi; Aota, Kenichi; and Motoda, Takashi, 4,943,319, Cl. 75-229.000.
Motorola, Inc.: *See*—
Bader, Scott K., 4,944,002, Cl. 379-388.000.
Ecklund, Lawrence M., 4,944,011, Cl. 381-15.000.
Morton, Bruce L.; Engles, Bruce E.; and Chaddock, Michael H., 4,943,948, Cl. 365-201.000.
O'Neil, Vernon P., II; and Navarro, Jesus A., 4,943,982, Cl. 375-81.000.
Pelley, Perry H., III; and Yu, Ruey J., 4,943,743, Cl. 307-475.000.
Piosenka, Gerald V.; Worger, William R.; and Savage, Michael A., 4,944,008, Cl. 380-46.000.
Rybicki, Mathew A., 4,943,784, Cl. 330-264.000.
Simmons, Marion I.; and Geyer, Harry J., 4,943,708, Cl. 235-492.000.
Swapp, Mavin C., 4,943,787, Cl. 331-2.000.
Wilson, Syd R.; Sellers, James A.; and Mattox, Robert J., 4,943,539, Cl. 437-195.000.
Motsumoto, Masahiko: *See*—
Shirai, Hiroshi; Tatsumi, Takashi; Kanda, Hisashi; Fukuo, Koichi; Motsumoto, Masahiko; and Hiro, Toshiaki, 4,942,854, Cl. 123-90.170.
Mott, Philip J., to Borg-Warner Corporation. Metal chain belt. 4,943,266, Cl. 474-201.000.
Mottweiler, Kurt R.: *See*—
Gelphman, Janet L.; and Mottweiler, Kurt R., 4,943,821, Cl. 354-99.000.
Moxon, Edwin C.: *See*—
Barker, Ronald C.; Schuler, Chester L.; Kiesel, Kenneth C.; and Moxon, Edwin C., 4,943,866, Cl. 358-335.000.
Muehlhausen, Robert A.; and Fairchild, John F., to Minnesota Mining and Manufacturing Company. Disk locking mechanism for disk cartridge. 4,943,880, Cl. 360-133.000.
Mukai, Kiichiro: *See*—
Tachi, Shinichi; Tsujimoto, Kazunori; Okudaira, Sadayuki; and Mukai, Kiichiro, 4,943,344, Cl. 156-643.000.
Mukai, Masahiro: *See*—
Okada, Tatsunori; Miyazaki, Masayuki; Tanaka, Toshihide; Hatoh, Chiaki; and Mukai, Masahiro, 4,943,495, Cl. 429-35.000.
Mukunoki, Yasuo: *See*—
Yoneyama, Masakazu; and Mukunoki, Yasuo, 4,943,520, Cl. 430-527.000.
Muller, Hartwig: *See*—
Reymann, Wolfgang; Gropp, Heiko-Ulrich; Vogel, Klaus; and Muller, Hartwig, 4,943,228, Cl. 425-526.000.
Reymann, Wolfgang; Gropp, Heiko-Ulrich; Vogel, Klaus; Muller, Hartwig; and Wiedenfeld, Walter, 4,943,229, Cl. 425-535.000.
Mullins, Michael J.: *See*—
Woo, Edmund P.; and Mullins, Michael J., 4,943,640, Cl. 548-551.000.
Munekata, Seiji: *See*—
Miyazaki, Nobuyuki; Unoki, Masao; and Munekata, Seiji, 4,943,614, Cl. 525-117.000.
Munninger, Wilhelm: *See*—
Heininger, Hans-Ulrich; Munninger, Wilhelm; and Pawlowsky, Ernst, 4,943,374, Cl. 210-651.000.
Murakami, Hiromichi: *See*—
Hirai, Kenshi; Murakami, Hiromichi; and Hatazawa, Kikuo, 4,943,936, Cl. 364-519.000.
Murata, Akio: *See*—
Wada, Toshiaki; and Murata, Akio, 4,943,882, Cl. 360-126.000.
Murata Kikai Kabushiki Kaisha: *See*—
Morihashi, Toshifumi; Sakai, Shoji; Nakayama, Teruo; Noda, Koshi; and Fujiwara, Michiaki, 4,942,731, Cl. 57-328.000.
Murata, Makoto: *See*—
Uekita, Masakazu; Awaji, Hiroshi; Murata, Makoto; and Mizunuma, Satoshi, 4,943,471, Cl. 428-220.000.

Murata Manufacturing Co., Ltd.: *See*—
Ito, Katsuo; Hibino, Eiichi; Nishimura, Masahiro; Kinoshita, Kazunori; and Takase, Shigeki, 4,943,810, Cl. 343-702.000.
Murayama, Hiroshi: *See*—
Aoyama, Tomoo; and Murayama, Hiroshi, 4,943,912, Cl. 364-200.000.
Muro, Hiroyuki: *See*—
Nishizawa, Susumu; Muro, Hiroyuki; Kasai, Masayasu; Hatano, Satoru; Kamiya, Syouzi; Kakeya, Nobuharu; and Kitao, Kazuhiko, 4,943,567, Cl. 514-203.000.
Murphy, Edward J.: *See*—
Noren, Gerry K.; and Murphy, Edward J., 4,943,600, Cl. 522-106.000.
Murphy, John: *See*—
Byrne, John V.; McMullin, Francis; Devitt, Francis; O'Dwyer, Jeremiah; Murphy, John; Egan, Michael; Brosnan, Michael; and Lawton, James, 4,943,760, Cl. 318-701.000.
Murphy, Patricia L.: *See*—
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; Deal, James F., III; and Bolden, Paul L., Jr., 4,943,390, Cl. 252-355.000.
Murphy, Patrick M., to Mif-Sud Industries, Inc. Quick disconnect with locking feature for pick and place devices. 4,943,181, Cl. 403-324.000.
Murray, Andrew M.: *See*—
Hefford, Robert J. W.; and Murray, Andrew M., 4,943,430, Cl. 424-70.000.
Murray, Richard C., Jr.: *See*—
Koch, Mark; and Murray, Richard C., Jr., 4,943,364, Cl. 204-415.000.
Musallam, Hikmat A.: *See*—
Field, Lamar; Musallam, Hikmat A.; Macke, Jeffrey D.; and Srivastava, Pramod K., 4,943,657, Cl. 562-125.000.
Mushika, Sadahiko; and Suzuki, Akira, to Aisin Seiki Kabushiki Kaisha; and Kabushiki Kaisha Shinsangyokaihatsu. Apparatus for driving a medical appliance. 4,942,735, Cl. 60-416.000.
Musil, Edward C., to Flexible Steel Lacing Company. Fastener with increased reach-back. 4,942,645, Cl. 24-33.00C.
Musso, John A. Wallet. 4,942,913, Cl. 150-138.000.
Muto, Naoto, to Fuji Jukogyo Kabushiki Kaisha. Lubricating system of a valve mechanism for a double overhead camshaft engine. 4,942,855, Cl. 123-90.330.
Mutschler, Martha A.; and Steffens, John C., to Cornell Research Foundation, Inc. 2,3,4-triacylhexose insect repellants. 4,943,563, Cl. 514-23.000.
Mutzabaugh, Dennis M.: *See*—
Citta, Richard W.; Gosc, Paul M.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., 4,944,006, Cl. 380-20.000.
Myers, David F.: *See*—
Gartner, Ellis M.; Myers, David F.; and Gaidis, James M., 4,943,323, Cl. 106-808.000.
Myers, Errol. Car radio holster. 4,942,995, Cl. 224-258.000.
Mylne, John M., III, to Toro Company, The. Irrigation controller having multiple cancel modes invoked by depressing single key. 4,943,917, Cl. 364-420.000.
Nabeshima, Takayuki; Matsui, Toru; and Maekawa, Yukio, to Minolta Camera Kabushiki Kaisha. Device for measuring object distance used for camera. 4,943,824, Cl. 354-400.000.
Naden, James M.: *See*—
Greenwood, John C.; and Naden, James M., 4,942,766, Cl. 73-704.000.
Nagai, Kyuichirou: *See*—
Takeda, Hidekazu; Nagai, Kyuichirou; Ogiro, Kenji; Aman, Mitsuji; and Takita, Kouhei, 4,943,874, Cl. 360-85.000.
Nagano, Masato: *See*—
Kumagai, Motoo; Kato, Keiichi; Nagano, Masato; and Sakaguchi, Michiaki, 4,943,469, Cl. 428-209.000.
Nagao, Matoko: *See*—
Yamada, Yasuyuki; Nagao, Matoko; and Morita, Kazuhiko, 4,943,479, Cl. 428-331.000.
Nagata, Shoichi: *See*—
Ohashi, Kunio; and Nagata, Shoichi, 4,943,826, Cl. 355-27.000.
Nagaura, Toru: *See*—
Oishi, Shigeru; Abe, Takao; Nagaura, Toru; and Watanabe, Mochiyuki, 4,943,497, Cl. 429-53.000.
Nagle, Dennis C.; and Van de Walle, Richard H., to Martin Marietta Magnesia Specialties Inc. Granulation of magnesium oxide particles. 4,943,301, Cl. 23-313.00R.
Naim, Yehuda: *See*—
Sanger, Sampson D., 4,943,097, Cl. 294-19.100.
Naito, Kimie, executor: *See*—
Scherer, Kirby V., Jr.; Yamanouchi, Kouichi; Yokoyama, Kazumasa; and Naito, Ryoichi, deceased, 4,943,595, Cl. 514-722.000.
Naito, Ryoichi, deceased: *See*—
Scherer, Kirby V., Jr.; Yamanouchi, Kouichi; Yokoyama, Kazumasa; and Naito, Ryoichi, deceased, 4,943,595, Cl. 514-722.000.
Naito, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Constant-speed running control device for vehicles. 4,943,923, Cl. 364-426.040.
Nakabayashi, Takeo: *See*—
Machida, Hirohisa; and Nakabayashi, Takeo, 4,943,965, Cl. 371-36.000.
Nakada, Takao: *See*—
Hayashi, Fusashi; Takei, Kooichi; Matii, Yooichi; Simazaki, Toshikatsu; Imai, Akihito; and Nakada, Takao, 4,943,542, Cl. 501-12.000.
Nakagawa, Ichiro: *See*—
Kitamura, Hideo; and Nakagawa, Ichiro, 4,943,011, Cl. 242-107.000.
Nakaji, Shigeru: *See*—
Okamoto, Kaizo; Ichihara, Akira; Sato, Akimune; Hirata, Kenji; Hirayama, Katsuhisa; Hina, Eiji; Nakaji, Shigeru; Sakamoto, Minoru; Tanaka, Takashi; and Shimizu, Keizo, 4,942,773, Cl. 73-864.450.
Nakajima, Etsuo: *See*—
Ozawa, Kazuhiro; Nakajima, Etsuo; and Yamaguchi, Isao, 4,943,326, Cl. 148-11.50N.
Nakajima, Jun; Araya, Takeshi; and Hioki, Susumu, to Hitachi, Ltd. Apparatus for and method of detecting arc length, apparatus for and method of controlling welding torch height, and automatic welder and automatic welding method. 4,943,701, Cl. 219-124.020.
Nakajima, Nobuyoshi: *See*—
Adachi, Yuuma; and Nakajima, Nobuyoshi, 4,943,723, Cl. 250-327.200.
Nakakura, Toshiyuki: *See*—
Ezawa, Hiroshi; Nakakura, Toshiyuki; Watanabe, Takayuki; and Tsushima, Hiroaki, 4,943,594, Cl. 521-79.000.
Nakamoto, Mitsuharu; Sano, Kazuhiko; and Kawasawa, Takashi, to Dai Nippon Insatsu Kabushiki Kaisha. Image-receiving sheet. 4,943,555, Cl. 503-227.000.
Nakamura Co., Ltd.: *See*—
Nakamura, Takashi, 4,942,705, Cl. 52-202.000.
Nakamura, Kazuhiro; Yoshioka, Tatsuya; Sawada, Ryoji; and Nakamura, Tomoji, to Sasshin Kogyo Kabushiki Kaisha. Battery voltage warning device. 4,943,777, Cl. 324-433.000.
Nakamura, Mitsutoshi: *See*—
Demizu, Ichiro; Nakamura, Mitsutoshi; and Kohri, Toshitaro, 4,943,506, Cl. 430-109.000.
Nakamura, Nobutaka, to Kabushiki Kaisha Toshiba. Memory system compatible with a conventional expanded memory. 4,943,910, Cl. 364-200.000.
Nakamura, Susao: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 4,944,030, Cl. 354-403.000.
Nakamura, Susumu, to Sankyo Oilless Industry, Inc. Programmable controlled turnblanking machine. 4,942,797, Cl. 83-76.900.
Nakamura, Takao, to Hashimoto Forming Industry Co., Ltd. Center hub cap for vehicle wheels. 4,943,122, Cl. 301-108.00A.
Nakamura, Takashi, to Nakamura Co., Ltd. Window grating arrangement. 4,942,705, Cl. 52-202.000.
Nakamura, Takashi: *See*—
Sano, Yasuro; and Nakamura, Takashi, 4,942,836, Cl. 112-445.000.
Nakamura, Tetsuji; and Watanabe, Ichiro, to Nitto Chemical Industry Co., Ltd. Process for the production of optically active (R)-(−)-3-halo-1,2-propanediol. 4,943,528, Cl. 435-158.000.
Nakamura, Tomoji: *See*—
Nakamura, Kazuhiro; Yoshioka, Tatsuya; Sawada, Ryoji; and Nakamura, Tomoji, 4,943,777, Cl. 324-433.000.
Nakano, Masahiro; Fukushima, Shoji; Kawaguchi, Takeo; and Suzuki, Yoshiki, to Teijin Limited. Intraarterial injection pharmaceuticals of 5-fluoro-2'-deoxyuridine esters. 4,943,564, Cl. 514-50.000.
Nakano, Yoshihito, to Kitagawa Industries, Co., Ltd. Wire clamp. 4,943,183, Cl. 403-406.100.
Nakao, Kazuo: *See*—
Hirose, Tadashi; Nakao, Kazuo; and Shinada, Keiko, 4,943,968, Cl. 371-19.000.
Nakao, Ken; Sato, Seishiro; and Ohkase, Wataru, to Tel Sagami Limited. Heat-treating apparatus. 4,943,235, Cl. 432-205.000.
Nakasuji, Yoshizumi: *See*—
Oda, Isao; Soma, Takao; Tsuno, Nobuo; Ando, Takashi; and Nakasuji, Yoshizumi, 4,942,999, Cl. 228-124.000.
Nakata, Yutaka, to Ichikoh Industries, Ltd. Projector-type head lamp for vehicles. 4,943,894, Cl. 362-61.000.
Nakayama, Tadashi: *See*—
Kimoto, Takahiro; Ohi, Hideo; Watanabe, Toshihisa; and Nakayama, Tadashi, 4,943,675, Cl. 544-330.000.
Nakayama, Teruo: *See*—
Morihashi, Toshifumi; Sakai, Shoji; Nakayama, Teruo; Noda, Koshi; and Fujiwara, Michiaki, 4,942,731, Cl. 57-328.000.
Nakayama, Yoshikazu, to Takata Corporation. Mounting arrangement for a vehicle air bag. 4,943,027, Cl. 248-548.000.
Nakazato, Tomomi: *See*—
Iwagaya, Takashi; and Nakazato, Tomomi, 4,943,905, Cl. 364-136.000.
Namikawa, Akira: *See*—
Tanisake, Hiroka; Okumura, Hiroyuki; Namikawa, Akira; Ishikawa, Masato; and Abe, Toshiaki, 4,943,607, Cl. 523-500.000.
Nanba, Akimasa: *See*—
Moroto, Shuzo; Sumiya, Koji; Yokoyama, Shouji; Nimura, Mitsuhiro; and Nanba, Akimasa, 4,943,925, Cl. 364-449.000.
Nanjo, Masashi: *See*—
Awamura, Masaki; Yamamoto, Kazushi; and Nanjo, Masashi, 4,943,431, Cl. 424-70.000.
Naraki, Akihiro; Abe, Masatoshi; Okamoto, Shin; and Okabe, Jun, to Nippon Mektron, Limited. Process for producing peroxide-vulcanizable, fluorine-containing elastomer. 4,943,622, Cl. 526-206.000.
Narayan, Perinchery: *See*—
Boroduliu, German; Shkornik, Alexander; Persidsky, Maxim D.; and Narayan, Perinchery, 4,942,869, Cl. 128-43.000.

Narikawa, Shiro: *See*—
Nojima, Hideo; Kojima, Yoshimi; Imada, Eiji; Matsuyama, Toshiro; Hayakawa, Takashi; Narikawa, Shiro; and Ehara, Shaw, 4,943,503, Cl. 430-66.000.

Narishige, Shinji: *See*—
Sano, Masaaki; Imagawa, Takao; Nishioka, Kouichi; Narishige, Shinji; Hanazono, Masanobu; Onishi, Takashi; and Yoshida, Toshihiro, 4,943,883, Cl. 360-126.000.

Narita, Yoshinori: *See*—
Matsuura, Tooru; and Narita, Yoshinori, 4,942,804, Cl. 92-212.000.

Nash, Richard C., to Fabcon, Inc. Hollow core concrete extruder. 4,943,219, Cl. 425-64.000.

Nathoo, Nazim S., to Shell Oil Company. Apparatus for forming preformed material. 4,943,222, Cl. 425-89.000.

National Machinery Company, The: *See*—
Dom, Harry A.; and Maistros, John A., 4,942,796, Cl. 83-72.000.

National Nuclear Corporation Limited: *See*—
Broadley, Donald, 4,943,409, Cl. 376-212.000.

National Research Council of Canada: *See*—
Foux, Amnon, 4,943,292, Cl. 606-70.000.

National Semiconductor Corporation: *See*—
Estrada, Julio R.; and Yarbrough, Roy L., 4,943,741, Cl. 307-455.000.

Navarro, Jesus A.: *See*—
O'Neil, Vernon P., II; and Navarro, Jesus A., 4,943,982, Cl. 375-81.000.

Naylor, Alan; Judd, Duncan B.; and Brown, Dearg S., to Glaxo Group Limited. Piperazine compounds. 4,943,578, Cl. 514-252.000.

Naylor, Alan: *See*—
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; and Campbell, Ian B., 4,943,591, Cl. 514-539.000.

Nazerian, Greg: *See*—
Hoffa, Jack L.; and Nazerian, Greg, 4,942,789, Cl. 81-9.510.

NCR Corporation: *See*—
Austin, Jeffrey R., 4,944,007, Cl. 380-21.000.

Neal, Merrill G.: *See*—
Jacobs, Gregory A.; and Neal, Merrill G., 4,942,745, Cl. 70-58.000.

NEC Corporation: *See*—
Hoshi, Katsuji, 4,943,738, Cl. 307-362.000.
Hoshino, Yukio; and Asai, Ko, 4,944,021, Cl. 382-5.000.
Kobayashi, Yasuaki, 4,943,947, Cl. 365-189.120.
Oguchi, Tetsuji, 4,943,801, Cl. 340-723.000.
Terayama, Kazuyoshi, 4,943,952, Cl. 365-207.000.

Nedelec, Lucien; Nique, Francois; Philibert, Daniel; Moguilewsky, Martine; and Bouton, Marie-Madeleine, to Roussel Uclafi. Novel 17-aryl-steroids. 4,943,566, Cl. 514-179.000.

Nedzu, Shigeru, to Polyplastics Co., Ltd. Heat-resistant composite sheet and container formed of the same. 4,943,459, Cl. 428-36.500.

Neff, Craig A., to Hunter Douglas, Inc. Expandable collapsible product and method and apparatus for its manufacture. 4,943,454, Cl. 428-12.000.

Neil, Robert M.: *See*—
Phillips, Emyr; Neil, Robert M.; and Wirth, Hermann O., 4,943,381, Cl. 252-51.50R.

Nelson, Brian P., to British Telecommunications, Public Limited Company. Coupler. 4,943,134, Cl. 350-96.130.

Nelson, Everett J.: *See*—
Hales, John C.; and Nelson, Everett J., 4,943,865, Cl. 358-335.000.

Nelson, James S.; Angell, Scott L.; Mannerud, Jack E.; and Bergman, Charles H., Jr., to BGK Finishing Systems, Inc. Automotive coating treating process. 4,943,447, Cl. 427-55.000.

Nelson, John C. Guide means for random access retrieval apparatus. 4,943,153, Cl. 353-25.000.

Nemoto, Shusuke: *See*—
Fujisaki, Koichiro; Ohashi, Ryota; and Nemoto, Shusuke, 4,942,780, Cl. 475-83.000.

Neri, Carlo: *See*—
Eaton, Philip; Nodari, Nereo; Neri, Carlo; Cassar, Luigi; Monti, Fabio; and Alberici, Fausto, 4,943,302, Cl. 44-56.000.

Nerrinck, Bernard: *See*—
Benoit, Louis; and Nerrinck, Bernard, 4,942,681, Cl. 36-119.000.

Nesser, Deborah L.: *See*—
Nesser, Thomas A.; Nesser, Deborah L.; Luckower, Herbert; Barczak, John P.; Joslyn, Edward P.; and Rick, Bernard J., 4,942,954, Cl. 194-351.000.

Nesser, Thomas A.: Nesser, Deborah L.; Luckower, Herbert; Barczak, John P.; Joslyn, Edward P.; and Rick, Bernard J., to G. T. Norton, Inc. Vending machine. 4,942,954, Cl. 194-351.000.

Neste Oy: *See*—
Yamawaki, Takashi, 4,943,615, Cl. 525-240.000.

Nestec S.A.: *See*—
McCabe, Edward M., 4,943,441, Cl. 426-511.000.

Neturen Company Limited: *See*—
Sato, Hiroki; and Seto, Yoshiki, 4,943,036, Cl. 266-104.000.

Neubauer, Hans-Juergen: *See*—
Buerstinghaus, Rainer; Neubauer, Hans-Juergen; Hofmeister, Peter; Kuenast, Christoph; Leyendecker, Joachim; and Kardorff, Uwe, 4,943,585, Cl. 514-398.000.
Theobald, Hans; Kuenast, Christoph; Hofmeister, Peter; Neubauer, Hans-Juergen; Kuekenhoehner, Thomas; Krieg, Wolfgang; Leyendecker, Joachim; and Kardorff, Uwe, 4,943,584, Cl. 514-380.000.

Neugebauer, Peter; and Meyer, Helmut, to Drehtainer Consulting GmbH. Container. 4,942,971, Cl. 220-1.500.

Neumann, Peter: *See*—
Aumueller, Alexander; Neumann, Peter; and Trauth, Hubert, 4,943,391, Cl. 252-401.000.

Neuwirth, Helmuth: *See*—
Meyerhoefer, Carl; Neuwirth, Helmuth; and Visconti, Peter, 4,944,003, Cl. 379-412.000.

New, Bernard J., to Advanced Micro Devices, Inc. Floating point add/subtract and multiplying assemblies sharing common normalization, rounding and exponential apparatus. 4,943,940, Cl. 364-748.000.

New Fei Lien Ent. Co., Ltd.: *See*—
Lin, Ling-Yung, 4,942,685, Cl. 40-152.200.

Newlands, Paulo R. J. Container for scalp products and base therefor. 4,942,890, Cl. 132-212.000.

Newman, Martin H. Drug delivery device. 4,942,883, Cl. 128-798.000.

NGK Insulators, Inc.: *See*—
Oda, Isao; Soma, Takao; Tsuno, Nobuo; Ando, Takashi; and Nakasuji, Yoshizumi, 4,942,999, Cl. 228-124.000.

NGK Insulators, Ltd.: *See*—
Iino, Atsushi; and Kato, Nobuhide, 4,943,330, Cl. 156-89.000.

NGK Spark Plug Co., Ltd.: *See*—
Matsuura, Tooru; and Narita, Yoshinori, 4,942,804, Cl. 92-212.000.
Shiromizu, Hisaharu; Morikawa, Asao; Sukegawa, Tsuneyuki; and Kondo, Kazuo, 4,943,470, Cl. 428-209.000.

Ngo, Khai D. T.; and Charles, Richard J., to General Electric Company. Dual-permeability core structure for use in high-frequency magnetic components. 4,943,793, Cl. 336-83.000.

Ni Industries, Inc.: *See*—
Hempelmann, Heinrich J., 4,943,121, Cl. 301-37.0SS.

Nicholas, John D., to MM Systems Corporation. End dam nosing material. 4,943,605, Cl. 523-438.000.

Nicolai, Charles M. Earthquake-proof absorption system for buildings or the like. 4,942,703, Cl. 52-167.00R.

Nied, Herman F.; and Inzinna, Louis P., to General Electric Company. Apparatus employing integral dielectric heater for roll forming thermoplastic material. 4,943,224, Cl. 425-174.80R.

Niimura, Yoshihiro; Kikuta, Ritsuo; and Usui, Katsuaki, to Ebara Corporation. Two-shaft type rotary machine having a tip circle diameter to shaft diameter within a certain range. 4,943,214, Cl. 418-9.000.

Niki, Kenichi; Kokogawa, Tohru; Ishizu, Akira; and Takasago, Hayato, to Mitsubishi Denki Kabushiki Kaisha. Testing device for electrical circuit boards. 4,943,768, Cl. 324-158.00F.

Nikon Corporation: *See*—
Mori, Susumu; and Shibuya, Masato, 4,943,733, Cl. 250-548.000.

Nilssen, Ole K. Series-excited parallel-loaded resonant circuit. 4,943,884, Cl. 361-15.000.

Nilsson, Bengt G.; and Lindahl, Bengt G., to Scan Coin AB. Coin sorting device with anticramping means. 4,943,257, Cl. 453-9.000.

Nimura, Mitsuhiro: *See*—
Moroto, Shuzo; Sumiya, Koji; Yokoyama, Shouji; Nimura, Mitsuhiro; and Nanba, Akimasa, 4,943,925, Cl. 364-449.000.

Ninomiya, Yuichi: *See*—
Kitaura, Hiromu; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, 4,943,858, Cl. 358-167.000.

Nippon Air Brake Co., Ltd.: *See*—
Okamoto, Kaizo; Ichihara, Akira; Sato, Akimune; Hirata, Kenji; Hirayama, Katsuhisa; Hina, Eiji; Nakaji, Shigeru; Sakamoto, Minoru; Tanaka, Takashi; and Shimizu, Keizo, 4,942,773, Cl. 73-864.450.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Iijima, Kenzaburou; Hayashi, Yoshinori; and Kurahashi, Kazuo, 4,944,028, Cl. 324-207.120.

Nippon Kayaku Kabushiki Kaisha: *See*—
Ikeda, Yoshiyuki; and Ariki, Toshinori, 4,942,817, Cl. 102-331.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Miyashita, Tsuneo; Nishio, Hiroaki; and Sato, Michitaka, 4,943,403, Cl. 264-233.000.

Nippon Mektron, Limited: *See*—
Naraki, Akihiro; Abe, Masatoshi; Okamoto, Shin; and Okabe, Jun, 4,943,622, Cl. 526-206.000.

Nippon Oil & Fats Co. Ltd.: *See*—
Kumagai, Motoo; Kato, Keiichi; Nagano, Masato; and Sakaguchi, Michiaki, 4,943,469, Cl. 428-209.000.

Nippon Seiko Kabushiki Kaisha: *See*—
Sasaki, Takanobu, 4,943,087, Cl. 280-804.000.

Nippon Soken, Inc.: *See*—
Takeda, Kenji; Kamiya, Sigeru; Suzuki, Satosi; and Yoshino, Yasuhisa, 4,943,123, Cl. 303-111.000.

Nippon Steel Chemical Co., Ltd.: *See*—
Sakura, Kathuhiko; Takeuchi, Genki; and Takeshita, Naoko, 4,943,553, Cl. 585-471.000.

Nippon Telegraph and Telephone Corporation: *See*—
Nojima, Toshio, 4,943,783, Cl. 330-149.000.

Nippon Thompson Co., Ltd.: *See*—
Kasai, Naomi, 4,943,169, Cl. 384-43.000.

Nippondenso Co., Ltd.: *See*—
Takeda, Kenji; Kamiya, Sigeru; Suzuki, Satosi; and Yoshino, Yasuhisa, 4,943,123, Cl. 303-111.000.

Nique, Francois: *See*—
Nedelec, Lucien; Nique, Francois; Philibert, Daniel; Moguilewsky, Martine; and Bouton, Marie-Madeleine, 4,943,566, Cl. 514-179.000.

Nisato, Dino; and Frigerio, Marco, to Sanofi. 3-aminoazetidine, its salts, process for their preparation and intermediates of synthesis. 4,943,641, Cl. 548-953.000.

Nishikawa, Hiroaki: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,943,916, Cl. 364-200.000.

Nishikawa, Masaji, to Olympus Optical Co., Ltd. Apparatus for measuring concentration of liquid developer. 4,943,735, Cl. 250-573.000.

Nishimoto, Yoshihito: *See*—
Sugisawa, Masanori; Sasaki, Takashi; and Nishimoto, Yoshihito, 4,943,360, Cl. 204-182.300.

Nishimura, Asaichi: *See*—
Tsunemi, Hidenari; Fushiki, Yasuo; Nishimura, Asaichi; and Kawai, Yousuke, 4,943,474, Cl. 428-246.000.

Nishimura, Kazuhiko: *See*—
Igarashi, Ichiro; and Nishimura, Kazuhiko, 4,942,906, Cl. 138-126.000.

Nishimura, Masahiro: *See*—
Ito, Katsuo; Hibino, Eiichi; Nishimura, Masahiro; Kinoshita, Kazunori; and Takase, Shigeki, 4,943,810, Cl. 343-702.000.

Nishimura, Yuji: *See*—
Yamamoto, Toshimasa; and Nishimura, Yuji, 4,943,010, Cl. 242-107.40A.

Nishio, Etsuro: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 4,944,030, Cl. 354-403.000.

Nishio, Hiroaki: *See*—
Miyashita, Tsuneo; Nishio, Hiroaki; and Sato, Michitaka, 4,943,403, Cl. 264-233.000.

Nishioka, Kouichi: *See*—
Sano, Masaaki; Imagawa, Takao; Nishioka, Kouichi; Narishige, Shinji; Hanazono, Masanobu; Onishi, Takashi; and Yoshida, Toshihiro, 4,943,883, Cl. 360-126.000.

Nishiyama, Ituo: *See*—
Uesaka, Kazuo; Yamada, Akira; Teramoto, Kazuyoshi; Nishiyama, Ituo; and Haraga, Kousuke, 4,943,862, Cl. 358-245.000.

Nishiyama, Shinichi; Yamaoka, Hideo; Yamanaka, Tooru; and Yamada, Tohru, to Mitsui Petrochemical Industries, Ltd. Novel substitued naphthalene compounds and liquid crystal compositions containing same. 4,943,651, Cl. 560-56.000.

Nishizawa, Susumu; Muro, Hiroyuki; Kasai, Masayasu; Hatano, Satoru; Kamiya, Syouzi; Kakeya, Nobuharu; and Kitao, Kazuhiko, to Kyoto Pharmaceutical Industries, Ltd. Cephalosporin compound and pharmaceutical composition thereof. 4,943,567, Cl. 514-203.000.

Nissan Motor Company, Limited: *See*—
Aida, Masahiro, 4,943,170, Cl. 384-99.000.
Fukunaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Hano, Sunao; and Satoh, Masaharu, 4,943,084, Cl. 280-707.000.
Imamura, Shuichiro, 4,942,908, Cl. 139-99.000.
Kanegae, Hidetoshi; Tomikashi, Minoru; Hino, Akira; and Ueno, Takashi, 4,943,924, Cl. 364-431.120.
Okahara, Hirofumi, 4,942,784, Cl. 74-866.000.
Sugimoto, Masaki; Morikawa, Kunihiko; Hitomi, Nobuteru; Ikeura, Kenji; Kitahara, Hisashi; Hirano, Hiroyuki; and Takatori, Kazuhiro, 4,942,771, Cl. 73-862.360.
Terasaka, Katsunori, 4,942,848, Cl. 123-1.00A.

Nitecki, Danute E.; and Aldwin, Lois, to Cetus Corporation. Certain pyridyl-di-sulfide-alkylenecarbonxylate-ortho-nitro-phenylsulfonic acid esters useful for coupling biological materials. 4,943,636, Cl. 546-294.000.

Nitoh, Hirohisa; Ohura, Osami; and Suzuki, Morio, to Tokai Denka Kogyo Kabushiki Kaisha. Process for preparing thiourea dioxide derivatives. 4,943,661, Cl. 564-26.000.

Nitta, Yukami: *See*—
Okazaki, Yoji; Nitta, Yukami; and Harada, Shigeyoshi, 4,943,173, Cl. 400-689.000.

Nitto Chemical Industry Co., Ltd.: *See*—
Nakamura, Tetsuji; and Watanabe, Ichiro, 4,943,528, Cl. 435-158.000.

Nitto Roseki Co., Ltd.: *See*—
Itagaki, Akinari; Yamaya, Masaaki; Yoshioka, Hiroshi; Watanabe, Akihiko; and Miyazato, Keita, 4,943,452, Cl. 427-299.000.

Nixon, John C.; Eady, John A.; and Goodes, Christopher G., to Comalco Aluminum Limited; Alcoa of Australia Limited; and Alcan Australia Limited. Process for the production of high purity coke from coal. 4,943,367, Cl. 208-131.000.

Nixon, William C.: *See*—
Breton, Bernard C.; Thong, John T. L.; and Nixon, William C., 4,943,722, Cl. 250-310.000.

Noack, Georg: *See*—
Levacher, Friedrich K.; Federmann, Helmut; Noack, Georg; and Kraus, Anton, 4,943,714, Cl. 250-227.160.

Noble, Edward E. Handgrip, with light and timer. 4,943,047, Cl. 272-68.000.

Noda, Koshi: *See*—
Morihashi, Toshifumi; Sakai, Shoji; Nakayama, Teruo; Noda, Koshi; and Fujiwara, Michiaki, 4,942,731, Cl. 57-328.000.

Nodari, Nereo: *See*—
Eaton, Philip; Nodari, Nereo; Neri, Carlo; Cassar, Luigi; Monti, Fabio; and Alberici, Fausto, 4,943,302, Cl. 44-56.000.

Noguchi, Satoru: *See*—
Shishido, Osamu; Noguchi, Satoru; and Seino, Seiji, 4,942,639, Cl. 15-83.000.

Nojima, Hideo; Kojima, Yoshimi; Imada, Eiji; Matsuyama, Toshiro; Hayakawa, Takashi; Narikawa, Shiro; and Ehara, Shaw, to Sharp Kabushiki Kaisha. Amorphous silicon photoreceptor. 4,943,503, Cl. 430-66.000.

Nojima, Toshio, to Nippon Telegraph and Telephone Corporation. Feed forward distortion correction circuit. 4,943,783, Cl. 330-149.000.

Nomura, Hironori: *See*—
Ujimoto, Hiroshi; Nomura, Hironori; and Yamamoto, Toshinori, 4,943,340, Cl. 156-496.000.

Nomura, Katsuhiko: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 4,944,030, Cl. 354-403.000.

Nonaka, Yoshiyuki: *See*—
Yoshizawa, Tomomi; Ogi, Keiji; Tosaka, Yasuo; Kuramoto, Kazuya; and Nonaka, Yoshiyuki, 4,943,518, Cl. 430-378.000.

Nooter Corporation: *See*—
Meyer, John J., 4,943,001, Cl. 228-173.400.

Noren, Gerry K.; and Murphy, Edward J., to DeSoto, Inc. Photocurable polyamine-ene compositions having improved cure speed. 4,943,600, Cl. 522-106.000.

Norgaard, Ronald. Automobile desk. 4,942,827, Cl. 108-44.000.

Norman, Alan B.: *See*—
Montoya, Maria T.; Norman, Alan B.; Sanders, Norman C., Jr.; and Creamer, Glenn E., 4,942,888, Cl. 131-359.000.

Norman, John A. T.; and Stevens, Robert E., to Air Products and Chemicals, Inc. Novel metal-diketone absorbents for olefins. 4,943,673, Cl. 585-845.000.

Noro, Masao, to Yamaha Corporation. Driving apparatus. 4,943,956, Cl. 367-137.000.

Noro, Masao, to Yamaha Corporation. Temperature compensation circuit for negative impedance driving apparatus. 4,944,020, Cl. 381-96.000.

North American Philips Corporation: *See*—
Bakhmutsky, Michael; Cavallerano, Alan P.; Tsinberg, Mikhail; and Basile, Carlo, 4,943,856, Cl. 358-141.000.

Northern Telecom Limited: *See*—
Morley, Robert S.; and Carew, Edward C., 4,944,004, Cl. 379-412.000.
Wilby, John L., 4,943,845, Cl. 357-74.000.

Norton Company: *See*—
Sung, Chien-Min; Chen, Sy-Hwa; Merrill, Leo; and Bigelow, Louis K., 4,943,488, Cl. 428-552.000.

Norton, Ian T.; and Brown, Charles R. T., to Lever Brothers Company. Edible dispersion. 4,943,445, Cl. 426-573.000.

Norton, Peter W.; Stobie, James A.; and Zimmermann, Peter H., to Honeywell Inc. Structure for improving interconnect reliability of focal plane arrays. 4,943,491, Cl. 428-620.000.

Noujaim, Sharbel E.: *See*—
Jacob, Philippe L.; Noujaim, Sharbel E.; Forman, Glenn A.; and Mallick, John A., 4,943,888, Cl. 361-96.000.

Novack, Robert C.: *See*—
Hargest, Thomas S.; Soltninasab, Sohrab; and Novack, Robert C., 4,942,635, Cl. 5-453.000.

Novaky, Mikael J. H.: *See*—
Jarvinen, Markku S.; Novaky, Mikael J. H.; and Rommi, Heikki P. J., 4,942,769, Cl. 73-82.100.

Nozaki, Hisashi; and Sakurai, Seiya, to Kabushikikaisha Kibun; and Kabushikikaisha Kyowashokuhin. Jelly resembling the flesh of fruit and process for producing the same. 4,943,444, Cl. 426-573.000.

Nozawa, Yusaku; Yuasa, Kazumasa; Ootu, Wataru; and Takahashi, Kinya, to Hitachi Construction Machinery Co., Ltd. Pressure control valve. 4,942,900, Cl. 137-490.000.

Nuber, Roland, to Wankel GmbH. Delivery valve of a rotary piston compressor. 4,943,217, Cl. 418-270.000.

Numako, Norio: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 4,944,030, Cl. 354-403.000.

Nyffeler, Urs: *See*—
Abdelgawad, Ahmed; Braem, Daniel; and Nyffeler, Urs, 4,942,887, Cl. 131-336.000.

Oak Industries, Inc.: *See*—
Cotic, Dennis J., 4,942,822, Cl. 104-16.000.

Obara, Toshio: *See*—
Yoshinaga, Yoshio; Shimizu, Wataru; and Obara, Toshio, 4,943,868, Cl. 358-403.000.

Obenauf, Eberhard: *See*—
Hoger, Ernst; and Obenauf, Eberhard, 4,942,661, Cl. 29-723.000.

Oberholz, Gerhard: *See*—
Forster, Arno; Oberholz, Gerhard; and Romuss, Christiane, 4,943,213, Cl. 417-310.000.

Occidental Chemical Corporation: *See*—
Stults, Jeffrey S.; and Schwartz, Willis T., 4,943,642, Cl. 549-241.000.

Oce-Nederland B.V.: *See*—
Geraets, Jacques J. M.; Graswinckel, Julius V. C.; and van der Sterren, Martin L., 4,943,831, Cl. 355-290.000.

O'Connell, William A.: *See*—
Daudelin, Abraham N.; Hartnett, Ronald J.; and O'Connell, William A., 4,943,995, Cl. 379-67.000.

Oda, Isao; Soma, Takao; Tsuno, Nobuo; Ando, Takashi; and Nakasuji, Yoshizumi, to NGK Insulators, Inc. Metal-ceramic joined composite bodies and joining process therefor. 4,942,999, Cl. 228-124.000.

Odan, Yuji: *See*—
Mihara, Toshihide; and Odan, Yuji. 4,942,657, Cl. 29-568.000.

O'Donnell, Miles C.: *See*—
Ashley-Rollman, Charles; O'Donnell, Miles C.; and McCormick, William, 4,943,770, Cl. 324-207.170.

O'Dwyer, Jeremiah: *See*—
Byrne, John V.; McMullin, Francis; Devitt, Francis; O'Dwyer, Jeremiah; Murphy, John; Egan, Michael; Brosnan, Michael; and Lawton, James, 4,943,760, Cl. 318-701.000.

Oehmichen, Eckhardt. Slide mount for perforated films. 4,942,684, Cl. 40-152.000.

Oest, Elvert E.: *See*—
Humpherys, Allan S.; and Oest, Elvert E., 4,943,184, Cl. 405-39.000.

Oetliker, Hans; Winiger, Peter; and Stempfel, Sonja, to Inotech AG. Method and apparatus for guiding and collecting light in photometry or the like. 4,943,159, Cl. 356-73.000.

Ogden, Ian E. Beer production. 4,943,436, Cl. 426-16.000.

Ogi, Keiji: *See*—
Yoshizawa, Tomomi; Ogi, Keiji; Tosaka, Yasuo; Kuramoto, Kazuya; and Nonaka, Yoshiyuki, 4,943,518, Cl. 430-378.000.

Ogihara, Satoru: *See*—
Yamazaki, Takeo; Ogihara, Satoru; Kosugi, Tetsuo; Shirakawa, Shingo; and Owada, Shinichi, 4,943,795, Cl. 338-21.000.

Ogiro, Kenji: *See*—
Takeda, Hidekazu; Nagai, Kyuichirou; Ogiro, Kenji; Aman, Mitsuji; and Takita, Kouhei, 4,943,874, Cl. 360-85.000.

Oguchi, Tetsuji, to NEC Corporation. Graphics display controller equipped with boundary searching circuit. 4,943,801, Cl. 340-723.000.

Ogura, Ichiro: *See*—
Asahina, Hiroshi; and Ogura, Ichiro, 4,943,987, Cl. 378-99.000.

Ogari, Takashi, to Brother Kogyo Kabushiki Kaisha. Overlock sewing machine with a looper-thread guide mechanism. 4,942,835, Cl. 112-302.000.

Ohashi, Kunio; and Nagata, Shoichi, to Sharp Kabushiki Kaisha. Image forming device with supplementary exposure device. 4,943,826, Cl. 355-27.000.

Ohashi, Ryota: *See*—
Fujisaki, Koichiro; Ohashi, Ryota; and Nemoto, Shusuke, 4,942,780, Cl. 475-83.000.

Ohashi, Shinichi: *See*—
Yarita, Takao; Moro, Yutaka; Takeishi, Kazuyasu; and Ohashi, Shinichi, 4,943,927, Cl. 364-470.000.

Ohi, Hideo: *See*—
Kimoto, Takahiro; Ohi, Hideo; Watanabe, Toshihisa; and Nakayama, Tadashi, 4,943,675, Cl. 544-330.000.

Ohio State University, The: *See*—
Richardson, Richard W., 4,943,702, Cl. 219-124.340.

Ohishi, Tadashi; and Umetsu, Hiroshi, to Hitachi, Ltd. Mixing apparatus for mixing reagent for use in automatic chemistry analyzer. 4,943,164, Cl. 366-149.000.

Ohkase, Wataru: *See*—
Nakao, Ken; Sato, Seishiro; and Ohkase, Wataru, 4,943,235, Cl. 432-205.000.

Ohkawara Kakohki Co., Ltd.: *See*—
Aishima, Shizuo; Takahashi, Yoshito; Kosemura, Masaki; and Ohkawara, Masaaki, 4,943,449, Cl. 427-213.300.

Ohkawara, Masaaki: *See*—
Aishima, Shizuo; Takahashi, Yoshito; Kosemura, Masaki; and Ohkawara, Masaaki, 4,943,449, Cl. 427-213.300.

Ohkubo, Hideki: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 4,944,030, Cl. 354-403.000.

Ohkubo, Masahiro, to Kabushiki Kaisha Daikin Seisakusho. Planetary gear train for automatic transmission. 4,942,779, Cl. 475-39.000.

Ohmatoi, Naoyuki. Electrostatic capacitor type sensing device. 4,943,889, Cl. 361-284.000.

Ohno, Kouji: *See*—
Inoue, Hiromichi; Inukai, Takashi; Saito, Shinichi; Miyazawa, Kazutoshi; and Ohno, Kouji, 4,943,385, Cl. 252-299.610.

Ohno, Tom T.: *See*—
Alden, Adrian W.; Jull, George W.; and Ohno, Tom T., 4,943,811, Cl. 343-814.000.

Ohnuki, Takashi: *See*—
Yatagai, Masanobu; and Ohnuki, Takashi, 4,943,652, Cl. 560-60.000.

Ohsawa, Akira, to Hitachi, Ltd. Geometric processing system. 4,944,034, Cl. 364-522.000.

Ohsawa, Takashi: *See*—
Watanabe, Yohji; and Ohsawa, Takashi, 4,943,745, Cl. 307-603.000.

Ohta, Mitsuru: *See*—
Sakai, Jun; Higashiyama, Shunichi; Suzuki, Koji; and Ohta, Mitsuru, 4,943,509, Cl. 430-138.000.

Ohtsuka, Hiroshi; and Ueno, Yutaka, to Luma Telecom Incorporated; and Mitsubishi Denki Kabushiki Kaisha. Still picture picturephone communications system. 4,943,994, Cl. 379-53.000.

Ohtsuka, Nobuaki: *See*—
Imamiya, Keniti; Tanaka, Sumio; Miyamoto, Junichi; Atsumi, Shigeru; Ohtsuka, Nobuaki; and Saito, Shinji, 4,943,962, Cl. 365-230.080.

Ohtsuka, Yoshimichi: *See*—
Kitaura, Hiromu; Ninomiya, Yuichi; Ohtsuka, Yoshimichi; and Izumi, Yoshinori, 4,943,858, Cl. 358-167.000.

Ohura, Osami: *See*—
Nitoh, Hirohisa; Ohura, Osami; and Suzuki, Morio, 4,943,661, Cl. 564-26.000.

Ohwada, Akira; Sakai, Masanori; and Tsutsumi, Yasuhisa. Reclining angle adjustment device. 4,943,116, Cl. 297-362.000.

Oishi, Kanji: *See*—
Yamaguchi, Yasunori; Oishi, Kanji; and Miyazawa, Kazuyuki, 4,943,949, Cl. 365-206.000.

Oishi, Shigeru; Abe, Takao; Nagaura, Toru; and Watanabe, Mochiyuki, to Sony Corporation. Cell having current cutoff valve. 4,943,497, Cl. 429-53.000.

Oka, Hideki: *See*—
Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, 4,943,716, Cl. 250-231.160.

Oka, Masahiko: *See*—
Morita, Shigeru; and Oka, Masahiko, 4,943,653, Cl. 560-219.000.

Okabayashi, Naonori: *See*—
Kihara, Seiichiro; and Okabayashi, Naonori, 4,943,736, Cl. 307-261.000.

Okabe, Jun: *See*—
Naraki, Akihiro; Abe, Masatoshi; Okamoto, Shin; and Okabe, Jun, 4,943,622, Cl. 526-206.000.

Okada, Hideo; Mori, Toshikatsu; Mitsugi, Kouichi; Iwase, Yoshio; Kuroe, Satoshi; Takeuchi, Masato; and Kamo, Tomoichi, to Hitachi, Ltd. Fuel cell, electrode for the cell and method of preparation thereof. 4,943,496, Cl. 429-45.000.

Okada, Taiiti; and Ishida, Toru, to Takeda Chemical Industries, Ltd. Process for producing nitrophenol compound. 4,943,666, Cl. 568-709.000.

Okada, Tatsunori; Miyazaki, Masayuki; Tanaka, Toshihide; Hatoh, Chiaki; and Mukai, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Fuel cell. 4,943,495, Cl. 429-35.000.

Okahara, Hirofumi, to Nissan Motor Company, Limited. Transmission control system for the automatic transmission of automotive vehicles for gear train locking upon unintended acceleration. 4,942,784, Cl. 74-866.000.

Okamoto, Hiroo: *See*—
Hatanaka, Yuji; Okamoto, Hiroo; Wakumura, Shin-ichi; Miyake, Ichiro; and Sakamoto, Shunichiro, 4,943,964, Cl. 371-31.000.

Okamoto, Kaizo; Ichihara, Akira; Sato, Akimune; Hirata, Kenji; Hirayama, Katsuhisa; Hina, Eiji; Nakaji, Shigeru; Sakamoto, Minoru; Tanaka, Takashi; and Shimizu, Keizo, to Kawasaki Steel Corp.; and Nippon Air Brake Co., Ltd. Device for sampling steel material. 4,942,773, Cl. 73-864.450.

Okamoto, Keiji: *See*—
Takada, Hiromi; Suzuki, Takami; Shiina, Toshio; Okamoto, Keiji; Komurasaki, Takeshi; Yoshioka, Satoru; Sakuma, Nobuo; and Matsuura, Tadashi, 4,943,128, Cl. 350-6.900.

Okamoto, Kikuhiko: *See*—
Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ara, Katsutoshi; Ito, Susumu; and Okamoto, Kikuhiko, 4,943,532, Cl. 435-209.000.

Okamoto, Shin: *See*—
Naraki, Akihiro; Abe, Masatoshi; Okamoto, Shin; and Okabe, Jun, 4,943,622, Cl. 526-206.000.

Okamura, Kouichi: *See*—
Ikeuchi, Masayuki; and Okamura, Kouichi, 4,943,717, Cl. 250-231.170.

Okazaki, Hisayoshi: *See*—
Terao, Shinji; Okazaki, Hisayoshi; and Imada, Isuke, 4,943,645, Cl. 552-309.000.

Okazaki, Masaki; Yabe, Masao; and Kawatta, Ken, to Fuji Photo Film Co., Ltd. Information recording medium. 4,943,515, Cl. 430-270.000.

Okazaki, Yoji; Nitta, Yukami; and Harada, Shigeyoshi, to Kabushiki Kaisha Toshiba. Sound dampening impact printer. 4,943,173, Cl. 400-689.000.

Okazawa, Koichi: *See*—
Izuno, Nobuaki; Kurosu, Yasuo; Okazawa, Koichi; Yokoyama, Yoshihiro; and Ooyu, Kensuke, 4,943,857, Cl. 358-148.000.

Okinaga, Takayuki; Tachi, Hiroshi; Ozaki, Hiroshi; Otsuka, Kanji; Furukawa, Michiaki; and Yamasaki, Yasuyuki, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Semiconductor device. 4,943,843, Cl. 357-70.000.

Okoshi, Hiromi: *See*—
Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ara, Katsutoshi; Ito, Susumu; and Okamoto, Kikuhiko, 4,943,532, Cl. 435-209.000.

Okudaira, Sadayuki: *See*—
Tachi, Shinichi; Tsujimoto, Kazunori; Okudaira, Sadayuki; and Mukai, Kiichiro, 4,943,344, Cl. 156-643.000.

Okumura, Hiroyuki: *See*—
Tanisake, Hiroka; Okumura, Hiroyuki; Namikawa, Akira; Ishikawa, Masato; and Abe, Toshiaki, 4,943,607, Cl. 523-500.000.

Okuri, Yasuhiro; and Sakakibara, Toshimori, to Sunstar Giken Kabushiki Kaisha. Structural adhesive having excellent anti-corrosion properties. 4,943,604, Cl. 523-428.000.

Oliff, Allen: *See*—
Heimbrook, David C.; Riemen, Mark W.; Oliff, Allen; and Saari, Walfred S., 4,943,561, Cl. 514-17.000.

Olin Corporation: *See*—
Pennington, B. Timothy; and Fullington, Michael C., 4,943,643, Cl. 549-532.000.

Olympus Optical Co., Ltd.: *See*—
Nishikawa, Masaji, 4,943,735, Cl. 250-573.000.
O'Meara, Thomas R., Jr.: *See*—
Grinberg, Jan; O'Meara, Thomas R., Jr.; and Welkowsky, Murray S., 4,943,709, Cl. 250-201.900.
Omoto, Yutaka: *See*—
Kakehi, Yutaka; Omoto, Yutaka; and Harada, Takeshi, 4,943,361, Cl. 204-192.320.
Omron Tateisi Electronics Co.: *See*—
Konishi, Keisuke, 4,943,715, Cl. 250-229.000.
Terada, Takao; and Kobayashi, Toshiyuki, 4,942,874, Cl. 128-203.160.
Onaka, Junji: *See*—
Hiraoka, Eiichi; Akagi, Toshio; Yano, Kiyotaka; and Onaka, Junji, 4,942,972, Cl. 220-3.000.
O'Neil, Vernon P., II; and Navarro, Jesus A., to Motorola, Inc. Baseband carrier phase corrector. 4,943,982, Cl. 375-81.000.
Ong, Helen H.; Anderson, Vernon B.; and Profitt, James A., to Hoechst-Roussel Pharmaceuticals Inc. Aminoalkylthiodibenzoxepins and pharmaceutical use. 4,943,571, Cl. 514-232.800.
Onishi, Makoto; Seita, Yukio; and Koyama, Noriyuki, to Terumo Kabushiki Kaisha. Hydrophilic porous membrane of polyvinylidene fluoride and method for production thereof. 4,943,373, Cl. 210-500.420.
Onishi, Takashi: *See*—
Sano, Masaaki; Imagawa, Takao; Nishioka, Kouichi; Narishige, Shinji; Hanazono, Masanobu; Onishi, Takashi; and Yoshida, Toshihiro, 4,943,883, Cl. 360-126.000.
Ono, Kenzo: *See*—
Sasaki, Kenji; Matsushita, Mitsuo; Ono, Kenzo; Horiwaki, Akihiro; Fujii, Katsunori; and Hatano, Hiroyuki, 4,943,829, Cl. 355-215.000.
Ono, Kikuo: *See*—
Konishi, Nobutake; Ono, Kikuo; Suzuki, Takaya; and Miyata, Kenji, 4,943,837, Cl. 357-23.700.
Ono, Shuji; and Kimura, Tsutomu, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,943,725, Cl. 250-327.200.
Ootu, Wataru: *See*—
Nozawa, Yusaku; Yuasa, Kazumasa; Ootu, Wataru; and Takahashi, Kinya, 4,942,900, Cl. 137-490.000.
Ooyama, Mitsuo: *See*—
Ando, Kimiaki; Ooyama, Mitsuo; and Saitou, Norio, 4,943,729, Cl. 250-492.300.
Ooyama, Nobumi: *See*—
Utsunomiya, Kazuhiro; Ooyama, Nobumi; and Sakaba, Hideo, 4,943,683, Cl. 376-245.000.
Ooyu, Kensuke: *See*—
Izuno, Nobuaki; Kurosu, Yasuo; Okazawa, Koichi; Yokoyama, Yoshihiro; and Ooyu, Kensuke, 4,943,857, Cl. 358-148.000.
Oppliger, Erich: *See*—
Monkewitz, Martin; and Oppliger, Erich, 4,942,775, Cl. 73-865.300.
Optyl Eyewear Fashion International Corporation: *See*—
Stadlmann, Gunter, 4,942,629, Cl. 2-435.000.
Ormat Inc.: *See*—
Bronicki, Lucien Y., 4,942,736, Cl. 60-641.120.
Ormsby, Jay L.: *See*—
Johnson, Carl E. A.; Ormsby, Jay L.; Chase, Eric T.; Quackenbos, George S.; Broude, Sergey V.; and Bou dour, Abdu, 4,943,734, Cl. 250-572.000.
Oros, Gyula: *See*—
Angyan, Sandor; Oros, Gyula; Racz, Istvan; and Detre, Tamas, 4,943,678, Cl. 514-374.000.
Ortho Pharmaceutical Corporation: *See*—
Rosen, Jonathan I.; and Warner, John F., 4,943,628, Cl. 530-326.000.
Osabe, Hirokazu: *See*—
Goto, Yukihisa; Masamoto, Kazuhisa; Yagihara, Hiroshi; Morishima, Yasuo; and Osabe, Hirokazu, 4,943,314, Cl. 71-94.000.
Osajima, Yutaka; Yamamura, Katsumi; and Unno, Yoshio, to Honshu Seishi Kabushiki Kaisha. Process for preparing a gas absorbent. 4,943,552, Cl. 502-417.000.
Osaki, Shigeyoshi, to Kanzaki Paper Manufacturing Co., Ltd. Instrument for measuring high frequency characteristics of sheet-like materials. 4,943,778, Cl. 324-636.000.
Oshino, Kazushi: *See*—
Kawai, Shuji; Oshino, Kazushi; Okoshi, Hiromi; Mori, Hajime; Ara, Katsutoshi; Ito, Susumu; and Okamoto, Kikuhiko, 4,943,532, Cl. 435-209.000.
Osman, Akhtar: *See*—
Mishra, Munmaya K.; and Osman, Akhtar, 4,943,616, Cl. 525-264.000.
Osowski, Frank. Automatic culvert directional flow control device. 4,942,898, Cl. 137-454.200.
Osteen, Mitchell M.: *See*—
Baldwin, Samuel L.; and Osteen, Mitchell M., 4,943,901, Cl. 362-277.000.
Osterburg, Gunther; and Prezelj, Milan, to Deutsche Texaco Aktiengesellschaft. Process for the continuous separation of water from methyl tert-butyl ether mixtures. 4,943,354, Cl. 203-14.000.
Ostlie, Lars S., to Infrawave A/S. Method and a system for counteracting marine biologic fouling of a hull or a submerged construction. 4,943,954, Cl. 367-191.000.
Ostrup, Heinrich: *See*—
Diekhans, Norbert; Fitzner, Werner; and Ostrup, Heinrich, 4,942,724, Cl. 56-10.400.
Ota, Akira: *See*—
Kawaguchi, Tomihisa; Ota, Akira; and Kawasaki, Akira, 4,942,960, Cl. 206-205.000.
Otomo, Shigekazu: *See*—
Takano, Hisashi; Hamakawa, Yoshihiro; Shiiki, Kazuo; Otomo, Shigekazu; and Kumasaka, Noriyuki, 4,943,879, Cl. 360-126.000.
Otsuka, Kanji: *See*—
Okinaga, Takayuki; Tachi, Hiroshi; Ozaki, Hiroshi; Otsuka, Kanji; Furukawa, Michiaki; and Yamasaki, Yasuyuki, 4,943,843, Cl. 357-70.000.
Otsuka, Tsutomu: *See*—
Yamamoto, Fumiaki; Otsuka, Tsutomu; and Funo, Yasuo, 4,943,408, Cl. 376-210.000.
Otten, Geneva G.: *See*—
Hastedt, Charlene M.; Medcalf, Ralph F., Jr.; and Otten, Geneva G., 4,943,392, Cl. 252-539.000.
Otto, Neal M., to Columbia Research and Manufacturing Company. Computer controllable multi-purpose platen thermal printer. 4,943,814, Cl. 346-1.100.
Ouchi, Teruo: *See*—
Takahashi, Nagashige; and Ouchi, Teruo, 4,942,867, Cl. 128-6.000.
Ouellette, Alan. Microelement and base assembly. 4,943,891, Cl. 361-392.000.
Owada, Shinichi: *See*—
Yamazaki, Takeo; Ogihara, Satoru; Kosugi, Tetsuo; Shirakawa, Shingo; and Owada, Shinichi, 4,943,795, Cl. 338-21.000.
Owens, Peter J.: *See*—
Fischer, Ronald H.; LaPierre, Rene B.; Owens, Peter J.; and Varghese, Philip, 4,943,366, Cl. 208-68.000.
Oxford Instruments, Ltd.: *See*—
Wilson, Martin N.; and Finlan, Martin F., 4,943,781, Cl. 328-234.000.
Oy Santasalo-Sohlberg AB: *See*—
Santasalo, Lauri; and Huhta-Koivisto, Esko, 4,942,847, Cl. 122-35.000.
Oy Wiik & Hoglund AB: *See*—
Back, John T., 4,943,463, Cl. 428-44.000.
Ozaki, Hiroshi: *See*—
Okinaga, Takayuki; Tachi, Hiroshi; Ozaki, Hiroshi; Otsuka, Kanji; Furukawa, Michiaki; and Yamasaki, Yasuyuki, 4,943,843, Cl. 357-70.000.
Ozaki, Tetsuo: *See*—
Hiramatsu, Takeo; Ozaki, Tetsuo; and Fujita, Kenjiro, 4,943,920, Cl. 364-424.100.
Ozawa, Kazuhiro; Nakajima, Etsuo; and Yamaguchi, Isao, to Furukawa Electric Co., Ltd., The; and Yamaguchi Pearl, Co., Ltd. Ornament and method of manufacturing the same. 4,943,326, Cl. 148-11.50N.
Ozgu, Mustafa R.: *See*—
Lewis, Thomas W.; Hamill, Paul E., Jr.; Ozgu, Mustafa R.; Padfield, Ralph C.; Rego, Donovan N.; and Brita, Guido P., 4,942,986, Cl. 222-590.000.
Ozmat, Burhan: *See*—
Gordon, Robert J.; Love, Brian J.; Peterson, Robert K.; and Ozmat, Burhan, 4,943,468, Cl. 428-210.000.
Pacson Limited: *See*—
Clayson, Andrew, 4,943,033, Cl. 251-88.000.
Padfield, Ralph C.: *See*—
Lewis, Thomas W.; Hamill, Paul E., Jr.; Ozgu, Mustafa R.; Padfield, Ralph C.; Rego, Donovan N.; and Brita, Guido P., 4,942,986, Cl. 222-590.000.
Page, Mary J.; Hamilton, Benton W.; Skiles, Bruce L.; and Reinhart, Robert V., Jr. Shield for devices capable of penetrating skin. 4,943,282, Cl. 604-198.000.
Pages, Etienne, to Haemonetics Corporation. Disposable centrifuge bowl for blood processing. 4,943,273, Cl. 494-41.000.
Palansky, Bruce J.: *See*—
Baltusis, Paul A.; Greene, Thomas L.; and Palansky, Bruce J., 4,943,921, Cl. 364-424.100.
Palco Telecom Inc.: *See*—
McGough, Gerald B., 4,942,748, Cl. 70-389.000.
Palfreyman, Michael G.; McDonald, Ian A.; and Bey, Philippe, to Merrell Dow Pharmaceuticals Inc. Inhibitors of lysyl oxidase. 4,943,593, Cl. 514-649.000.
Palmer, Donald J.; and Morris, Peter C., to Hewlett-Packard Company. Method of generating overhead transparency projecting using an ink-jet device. 4,943,813, Cl. 346-1.100.
Palou, Antonio S.; and Tarragona, Margarita V. Mental game. 4,943,054, Cl. 273-1.00R.
Panaroni, Vincent E. Apparatus for making foam products. 4,943,223, Cl. 425-116.000.
Pap, Laszlo: *See*—
Detre, Tamas; Angyan, Sandor; Pap, Laszlo; Szego, Andras; Karadi, Zoltan; Bertus nee Bende, Klara; and Marmarosi nee Kellner, Katalin, 4,943,307, Cl. 71-3.000.
Papeteries de Gascogne: *See*—
Gomez, Daniel, 4,943,349, Cl. 162-158.000.
Papineau, Robert. Portable alarm system with sealed enclosure. 4,943,799, Cl. 340-521.000.
Papuchon, Michel: *See*—
Delacourt, Dominique; Papuchon, Michel; and Pocholle, Jean Paul, 4,943,144, Cl. 350-354.000.
Parida, Ashok K.: *See*—
Linke, Thomas A.; Wilkerson, Alan W.; and Parida, Ashok K., 4,942,795, Cl. 83-72.000.

Parker, J. Wesley: *See—*
Breneman, Bruce C.; Parker, J. Wesley; and Sarwinski, Raymond E., 4,943,774, Cl. 324-318.000.
Parris, Warren M.: *See—*
Bania, Paul J.; and Parris, Warren M., 4,943,412, Cl. 420-420.000.
Pastva, John V., to Eastern Company, The. Cartainside truck trailer access system and lock assembly. 4,943,110, Cl. 296-181.000.
Patera, Anthony T.: *See—*
Gevelber, Michael A.; and Patera, Anthony T., 4,943,160, Cl. 356-372.000.
Patten, James T.: *See—*
Waechter, Jerome R.; Patten, James T.; and Kempter, Paul C., 4,943,963, Cl. 370-94.100.
Patterson, James A. Improved process for producing uniformly plated microspheres. 4,943,355, Cl. 204-20.000.
Patton, Gary J.: *See—*
Aslin, Matthew J.; and Patton, Gary J., 4,943,919, Cl. 364-424.030.
Patzelt, Ulrich, to SMS Schloemann-Siemag Aktiengesellschaft. Arrangement for axially displacing rolls in rolling mill stands. 4,942,754, Cl. 72-247.000.
Patzschke, Hans-Peter; Luttenberg, Albrecht; Schlinsog, Hans-Jurgen; and Bogdan, Wolfgang, to Herberts Gesellschaft mit beschrankter Haftung. Process for applying an aqueous, heat-curable coating to cans. 4,943,359, Cl. 204-181.600.
Pavlovsky, Rudolf: *See—*
Henych, Ivo; and Pavlovsky, Rudolf, 4,943,411, Cl. 423-566.000.
Pawlowsky, Ernst: *See—*
Heininger, Hans-Ulrich; Munninger, Wilhelm; and Pawlowsky, Ernst, 4,943,374, Cl. 210-651.000.
Pear, Julie R.: *See—*
Houck, Catherine M.; and Pear, Julie R., 4,943,674, Cl. 800-205.000.
Pechanek, Gerald G.; Shippy, David J.; Snedaker, Mark C.; and Woodward, Sandra S., to International Business Machines Corporation. Data processing system parallel data bus having a single oscillator clocking apparatus. 4,943,984, Cl. 375-109.000.
Pechnik, Alexander; and Matthews, M. Dean, to University of California, The Regents of the. Vapor phase redistribution in multi-component systems. 4,943,320, Cl. 75-235.000.
Pecora, Gennaro L., to Burndy Corporation. Hydraulic press with infinite head rotation. 4,942,757, Cl. 72-453.160.
Pedersen, Anders: *See—*
Kvanta, Endre; Pedersen, Anders; and Alexandersson, Lars, 4,943,437, Cl. 426-61.000.
Pedersen, Peder C.; and Green, Thomas J., Jr., to Worcester Polytechnic Institute. Digital sweep generator. 4,943,779, Cl. 328-14.000.
Pelley, Perry H., III; and Yu, Kuey J., to Motorola, Inc. TTL to ECL input buffer. 4,943,743, Cl. 307-475.000.
Pelrine, Bruce P.: *See—*
Chang, Clarence D.; Han, Scott; and Pelrine, Bruce P., 4,943,545, Cl. 502-56.000.
Peltier, Marcel: *See—*
Khaladji, Jean; and Peltier, Marcel, 4,942,697, Cl. 51-283.00R.
Pence, Charles F.: *See—*
Jones, Jimmie J.; Watson, Sherman L.; and Pence, Charles F., 4,942,701, Cl. 52-126.100.
Pennington, B. Timothy; and Fullington, Michael C., to Olin Corporation. Molten salt catalyzed oxidation of alkanes or olefins using lower temperture nitrate salts. 4,943,643, Cl. 549-532.000.
Peppel, George W., to Lockheed Corporation. Rotating lug anchor connector. 4,943,188, Cl. 405-224.000.
Peres, Philippe: *See—*
Gloton, Jean-Pierre; and Peres, Philippe, 4,943,464, Cl. 428-76.000.
Perregaard, Jens: *See—*
Boegesoe, Klaus P.; and Perregaard, Jens, 4,943,590, Cl. 514-469.000.
Perrot, Michel: *See—*
Mertz, Jean-Luc; Guerin, Hubert; Perrot, Michel; and De Robertis, Patrick, 4,943,691, Cl. 200-151.000.
Perry, David L.: *See—*
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Perry, Loren R.: *See—*
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Boroduliu, German; Shkornik, Alexander; Persidsky, Maxim D.; and Narayan, Perinchery, 4,942,869, Cl. 128-43.000.
Pertl, Peter; and Knauss, Uwe, to Pertl, Peter. Sensor controlled leveling device. 4,943,158, Cl. 356-4.000.
Peters, Duane; and Peters, Ty C. Little mini snowman game. 4,943,060, Cl. 273-109.000.
Peters, Ty C.: *See—*
Peters, Duane; and Peters, Ty C., 4,943,060, Cl. 273-109.000.
Peterson, Robert K.: *See—*
Gordon, Robert J.; Love, Brian J.; Peterson, Robert K.; and Ozmat, Burhan, 4,943,468, Cl. 428-210.000.
Petito, George: *See—*
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Petitou, Maurice: *See—*
Jacquinet, Jean-Claude; Petitou, Maurice; Sinay, Pierre; and Choay, Jean, 4,943,630, Cl. 536-123.000.
Petroleum Fermentations N.V.: *See—*
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; Deal, James F., III; and Bolden, Paul L., Jr., 4,943,390, Cl. 252-355.000.
Pfleiderer, Ernst: *See—*
Christner, Juergen; Pfleiderer, Ernst; Taeger, Tilman; and Bernschein, Ursula, 4,943,530, Cl. 435-188.000.
Pharm-Allergan GmbH: *See—*
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Pharmetrix Corporation: *See—*
Baker, Richard W.; Kochinke, Frank; and Huang, Carl, 4,943,435, Cl. 424-448.000.
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Nedelec, Lucien; Nique, Francois; Philibert, Daniel; Moguilewsky, Martine; and Bouton, Marie-Madeleine, 4,943,566, Cl. 514-179.000.
Philip Morris Incorporated: *See—*
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Phillips, Emyr; Neil, Robert M.; and Wirth, Hermann O., to Ciba-Geigy Corporation. Nitrogen-containing additives for non-aqueous functional fluids. 4,943,381, Cl. 252-51.50R.
Phillips Petroleum Company: *See—*
Kolts, John H.; Brown, Scott H.; and Tooley, Patricia A., 4,943,550, Cl. 502-327.000.
Matson, Michael S., 4,943,668, Cl. 585-456.000.
Waldrop, Joe R., 4,943,404, Cl. 264-257.000.
Young, Roger A., 4,943,918, Cl. 364-421.000.
Photo Redux Corp.: *See—*
Van Antwerp, William P.; Steinmetz, Mark G.; and Goudy, Paul R., Jr., 4,943,357, Cl. 204-157.150.
Pialet, Joseph W., to Lubrizol Corporation, The. Cetane improver. 4,943,303, Cl. 44-57.000.
Picker International, Inc.: *See—*
Plummer, Steven J., 4,943,726, Cl. 250-363.020.
Pierce-Bjorklund, Patricia. Compound solar collector building construction. 4,942,865, Cl. 126-431.000.
Pierce, William E.: *See—*
Dews, Edwin P.; Pierce, William E.; Gunnarson, John A.; and Ehrenfried, Albert D., 4,942,764, Cl. 73-301.000.
Pinkhasov, Eduard, to Vapor Technologies Inc. High penetration deposition process and apparatus. 4,942,844, Cl. 118-723.000.
Pinnow, Douglas A., to Universal Photonix, Inc. Operator lockout prevention device. 4,942,747, Cl. 70-263.000.
Pinnow, Kenneth E.: *See—*
Rednerski, Lawrence S.; Pinnow, Kenneth E.; and Eckenrod, John J., 4,942,922, Cl. 165-134.100.
Pinol, Augusto C.: *See—*
Constansa, Jordi F.; Corominas, Juan P.; and Pinol, Augusto C., 4,943,570, Cl. 514-222.800.
Pinschmidt, Robert K., Jr.; and Lai, Ta-Wang, to Air Products and Chemicals, Inc. Thermolysis of poly(N-vinylformamide) to poly(N-vinylamine). 4,943,676, Cl. 525-383.000.
Pioneer Electric Corporation: *See—*
Hatanaka, Yuji; Okamoto, Hiroo; Wakumura, Shin-ichi; Miyake, Ichiro; and Sakamoto, Shunichiro, 4,943,964, Cl. 371-31.000.
Pioneer Electronic Corporation: *See—*
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Piorr, Robert: *See—*
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Piosenka, Gerald V.; Worger, William R.; and Savage, Michael A., to Motorola, Inc. Electronic keying scheme for locking data. 4,944,008, Cl. 380-46.000.
Piretti, Giancarlo. Chair backrest linkage mechanism. 4,943,114, Cl. 297-301.000.
Pittsburgh Mineral & Environmental Technology, Inc.: *See—*
Gilbert, Stanley R.; and Weyand, Thomas E., 4,943,368, Cl. 209-2.000.
Pitzenberger, Steven M.: *See—*
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Plessey Overseas Limited: *See—*
Arnold, John S., 4,943,959, Cl. 370-85.500.
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Cowley, Nicholas P., 4,943,981, Cl. 377-47.000.
Laws, Peter G.; and Fletcher, Graham J., 4,943,788, Cl. 331-11.000.
Plummer, Steven J., to Picker International, Inc. Tomographic and whole body imaging table. 4,943,726, Cl. 250-363.020.
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Symons, Robert W., 4,943,256, Cl. 446-278.000.
Pocholle, Jean Paul: *See—*
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Poignant, Jean C.: *See—*
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Polito, Gino; and Maloberti, Franco, to Marelli Autronica S.p.A. Device and a method for the detection of pinking in Otto engines. 4,943,776, Cl. 324-391.000.
Polityka, Gregory A.: *See—*
Skrbina, John R.; Polityka, Gregory A.; and Smith, Mark L., 4,943,109, Cl. 296-146.000.
Pollart, Kenneth A.; and Lafferty, Terrence P., to James River Corporation of Virginia. Microwave reactive heater. 4,943,456, Cl. 428-34.300.
Polylactane, Inc.: *See—*
Magnus, George; and Kelley, Brian, 4,943,649, Cl. 536-124.000.
Polyplastics Co., Ltd.: *See—*
Nedzu, Shigeru, 4,943,459, Cl. 428-36.500.
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Chalifoux, Raymond J.; and Kozachuk, John, 4,942,920, Cl. 165-1.000.

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Pomerene, James H.: *See—*
Emma, Philip G.; Knight, Joshua W., III; Pomerene, James H.; Rechtschaffen, Rudolph N.; and Sparacio, Frank J., 4,943,908, Cl. 364-200.000.
Ponce, Hector O.; and Prole, Aleksandar, to Westinghouse Electric Corp. Method and apparatus for conducting current from a dynamo-electric machine. 4,943,749, Cl. 310-260.000.
Popoff, Alexander A., to Boeing Company, The. Optical backplane interconnection. 4,943,136, Cl. 350-96.160.
Poran, Michael; Langner, Carl; and Hury, Shlomo, to SMS Concast, Inc. Mold and support zone for continuous casting. 4,942,919, Cl. 164-420.000.
Porsche AG: *See—*
Hoffmann, Martin; Schittenheim, Helge; Wierschem, Franz-Rudolf; and Eichhorn, Horst, 4,943,028, Cl. 248-548.000.
Porta Systems Corp.: *See—*
Meyerhoefer, Carl; Neuwirth, Helmuth; and Visconti, Peter, 4,944,003, Cl. 379-412.000.
Portals Limited: *See—*
Melling, Raymond J.; and Knight, Malcolm R. M., 4,943,093, Cl. 283-83.000.
Post, Joseph. Ice fishing mechanism. 4,942,687, Cl. 43-17.000.
Potet, Jean-Claude: *See—*
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Pottorff, Earl T. Cover for collapsing board. 4,943,226, Cl. 425-326.100.
PowCon Inc.: *See—*
Thommes, James M., 4,943,699, Cl. 219-121.570.
Power Reactor and Nuclear Fuel Development Corporation: *See—*
Utsunomiya, Kazuhiro; Ooyama, Nobumi; and Sakaba, Hideo, 4,943,683, Cl. 376-245.000.
Powers, Brice. Free-weight exercising barbells. 4,943,052, Cl. 272-123.000.
Powers, Richard G.: *See—*
Schack, Warren R.; and Powers, Richard G., 4,943,442, Cl. 426-513.000.
Powers, Stephen R.; Finn, Peter J.; and Fisher, Michael G., to Minnesota Mining and Manufacturing Company. Imaging system. 4,943,517, Cl. 430-301.000.
Prater, Ronald E. Mandrel for making elastomeric aritcles. 4,943,225, Cl. 425-275.000.
Precht, Terry A.: *See—*
Cannon, Thomas G.; Roemmich, Bruce D.; and Precht, Terry A., 4,943,877, Cl. 360-106.000.
President & Fellows of Harvard College: *See—*
Corey, Elias J., 4,943,635, Cl. 546-13.000.
Prezelj, Milan: *See—*
Osterburg, Gunther; and Prezelj, Milan, 4,943,354, Cl. 203-14.000.
Priceman, Seymour, to Barson Corporation. Refractory metal composite coated article. 4,942,732, Cl. 60-261.000.
Prince Corporation: *See—*
VanderLaan, Kenneth J., 4,943,111, Cl. 297-194.000.
Procter & Gamble Company, The: *See—*
Hastedt, Charlene M.; Medcalf, Ralph F., Jr.; and Otten, Geneva G., 4,943,392, Cl. 252-539.000.
Production Diagnostics, Inc.: *See—*
Slusser, J. Michael, 4,942,896, Cl. 137-360.000.
Produits Chimiques Ugine Kuhlmann: *See—*
Dubreux, Bernard; and Laviron, Charles, 4,943,654, Cl. 560-251.000.
Profitt, James A.: *See—*
Ong, Helen H.; Anderson, Vernon B.; and Profitt, James A., 4,943,571, Cl. 514-232.800.
Prokubovsky, Vladimir I.: *See—*
Saveliev, Viktor S.; Yablokov, Evgeny G.; Prokubovsky, Vladimir I.; Kolody, Stepan M.; Saveliev, Sergei V.; and Smirnov, Ary A., 4,943,297, Cl. 606-200.000.
Prole, Aleksandar: *See—*
Ponce, Hector O.; and Prole, Aleksandar, 4,943,749, Cl. 310-260.000.
Pronova AB: *See—*
Berg, Sven-Olof; and Broden, Ingemar, 4,943,168, Cl. 383-38.000.
Proprietary Technology, Inc.: *See—*
Bartholomew, Donald D., 4,943,091, Cl. 285-12.000.
Protter, Andrew A.; Vigne, Jean-Louis; Mallory, Joanne B.; Talmadge, Karen D.; and Kane, John P., to California Biotechnology Inc. Mature aposi protein production under serum free culturing conditions. 4,943,527, Cl. 435-69.600.
Provan, Alexander R.; and Vanderlee, David G., to Mobil Oil Corporation. Apparatus for denesting and feeding cartons to a conveyor. 4,943,207, Cl. 414-797.700.
Przybylowicz, Catherine S.; Jacobs, Merrit N.; and Douglas, Joseph S., to Eastman Kodak Company. Grooved cover for test elements. 4,943,415, Cl. 422-56.000.
Ptaschek, Georg: *See—*
Schlamp, Guenther; Gall, Klaus P.; Langer, Adolf; and Ptaschek, Georg, 4,943,362, Cl. 204-298.130.
PUMA Aktiengesellschaft Rudolf Dassler Sport: *See—*
Flemming, Udo; and Bauer, Willi, 4,942,677, Cl. 36-27.000.
Purcell, Alexander M.: *See—*
Siefer, David A.; and Purcell, Alexander M., 4,943,689, Cl. 178-18.000.
Pure Water, Inc.: *See—*
Shannon, David J., 4,943,353, Cl. 202-181.000.
Purifiner Manufacturing Company: *See—*
Lefebvre, Byron; and Schoen, Jelle P., 4,943,352, Cl. 196-46.100.
QC Optics, Inc.: *See—*
Johnson, Carl E. A.; Ormsby, Jay L.; Chase, Eric T.; Quackenbos, George S.; Broude, Sergey V.; and Bou dour, Abdu, 4,943,734, Cl. 250-572.000.
Quack, Ulrich: *See—*
Kallen, Wilhelm; and Quack, Ulrich, 4,942,915, Cl. 164-34.000.
Quackenbos, George S.: *See—*
Johnson, Carl E. A.; Ormsby, Jay L.; Chase, Eric T.; Quackenbos, George S.; Broude, Sergey V.; and Bou dour, Abdu, 4,943,734, Cl. 250-572.000.
Quazi, Fazle S., to Etta Industries, Inc. Circuitry for limiting current between power inverter output terminals and ground. 4,943,886, Cl. 361-42.000.
Quick, Bradley S., to James L. Taylor Manufacturing Company Inc. Method and apparatus for selecting wood stock to form panels of predetermined size. 4,943,328, Cl. 156-64.000.
Quidel: *See—*
Eisinger, Robert W.; Khalil, Mohammed H.; Katz, David H.; and Sargeant, Robert B., 4,943,522, Cl. 435-7.000.
Quirk, Michael J.; Drake, Timothy E.; and Zarycki, John E., to Renold, Inc. Non-metallic gear shaker. 4,942,776, Cl. 74-61.000.
R. J. Reynolds Tobacco Company: *See—*
Montoya, Maria T.; Norman, Alan B.; Sanders, Norman C., Jr.; and Creamer, Glenn E., 4,942,888, Cl. 131-359.000.
R. W. Lyall & Company, Inc.: *See—*
Lyall, Lucian H.; and Renau, Karol Z., 4,943,706, Cl. 219-494.000.
Raahauge, Jerald C., to Sumner & Taylor, Inc. Adaptor for universal X-Y plotter pen. 4,943,817, Cl. 346-140.00A.
Rabe, William T.; and Gilbert, Wendell L., to TRW Inc. Steering gear with pressure-balanced valve. 4,942,803, Cl. 91-370.000.
Rabenau, Richard; Kanner, Rowland W.; and Cerola, Joseph J., to Ryder International Corporation. Humidifier apparatus. 4,943,704, Cl. 219-275.000.
Rabian, Jean; Potet, Jean-Claude; and Buchon, Michel, to Societe d'Etudes, Recherches et Constructions Electroniques - Sercel. Atomic clock. 4,943,955, Cl. 368-156.000.
Rabinow, Jacob. Interchangeable key lock with rolling tumblers. 4,942,749, Cl. 70-495.000.
Racz, Istvan: *See—*
Angyan, Sandor; Oros, Gyula; Racz, Istvan; and Detre, Tamas, 4,943,678, Cl. 514-374.000.
Radcliffe, Allan F. Adjustable arcuate razor head. 4,942,662, Cl. 30-49.000.
Radisch, Herbert R., Jr.: *See—*
Farr, Andrew F.; and Radisch, Herbert R., Jr., 4,942,788, Cl. 76-115.000.
Radjy, Farrokh F. Method and apparatus for non-destructive evaluation of concrete. 4,943,930, Cl. 364-506.000.
Radovan, Giuseppe; Blaseck, Klaus; Hoffmeister, Lothar; Westendorf, Helmut; Sandling, Michael J.; and Davidson, James W., to Xomox Limited; and Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Remote control and remote handling accessory, especially for the hot zone of radioactive plants. 4,942,897, Cl. 137-454.200.
Radziejewski, Ian R.: *See—*
Hardy, R. H. Stephen; and Radziejewski, Ian R., 4,944,038, Cl. 370-85.500.
Raeymaekers, Alfons H. M.; Freyne, Eddy J. E.; Van Gelder, Josephu L. H.; and Venet, Marc G., to Janssen Pharmaceutica N.V. (1H-azol-1-ylmethyl) substituted benzotriazole derivatives and pharmaceutical compositions containing them. 4,943,574, Cl. 514-338.000.
Ragan, Lawrence H.: *See—*
Gehring, Mark R.; Suter, Richard R.; and Ragan, Lawrence H., 4,944,025, Cl. 455-207.000.
Raha, Sanghamitra: *See—*
Jolles, Pierre; Fiat, Anne-Marie; Soria, Claudine; Levy-Toledano Sylviane; Raha, Sanghamitra; Mazoyer, Elisabeth; and Drouet, Ludovic, 4,943,562, Cl. 514-18.000.
Ramachandran, Ramakrishnan; Andrecovich, Mark J.; MacLean, Donald L.; and Satchell, Donald P., Jr., to BOC Group, Inc., The. Process for the production of nitriles. 4,943,650, Cl. 558-319.000.
Rancho Industries, Inc.: *See—*
Golpe, William, 4,943,081, Cl. 280-666.000.
Rasch, Juergen: *See—*
Golladay, Steven D.; Hohn, Fritz J.; Hutson, David J.; Meisburger, William D.; and Rasch, Juergen, 4,943,769, Cl. 324-158.00R.
Rauscher, Elli; Griffiths, John; and Dixon, Leonard F., to Boehringer Mannheim GmbH. Gamma-glutamyl-4-azoanilides, process for the preparation thereof and diagnostic agents containing them. 4,943,526, Cl. 435-15.000.
Rautaruukki Oy: *See—*
Koskinen, Matti; and Brostrom, Pekka, 4,943,193, Cl. 410-69.000.
Ray, Andrew M.: *See—*
Dykstra, Jerald P.; and Ray, Andrew M., 4,943,728, Cl. 250-492.300.
Ray, Edward D., Sr. Sheath. 4,942,663, Cl. 30-151.000.
Raymond Engineering Inc.: *See—*
Snyder, Robert F.; and Ferguson, John H., 4,942,794, Cl. 81-57.220.
Raynaud, Guy-Michel; Realis, Louis; and Constant, Didier, to Cegedur Societe de Transformation de l'Aluminum Pechiney. Method of brazing aluminum alloys without filler metal. 4,943,000, Cl. 228-193.000.
RCA Licensing Corporation: *See—*
Sparks, Bradley A., 4,943,961, Cl. 365-228.000.

Realis, Louis: *See—*
Raynaud, Guy-Michel; Realis, Louis; and Constant, Didier, 4,943,000, Cl. 228-193.000.
Reardon, David C. Fingerprint sensitive pad. 4,943,089, Cl. 283-81.000.
Reardon, Edward J.: *See—*
Lazarus, Richard M.; Reardon, Edward J.; and Dixit, Sunit S., 4,943,511, Cl. 430-192.000.
Rechtschaffen, Rudolph N.: *See—*
Emma, Philip G.; Knight, Joshua W., III; Pomerene, James H.; Rechtschaffen, Rudolph N.; and Sparacio, Frank J., 4,943,908, Cl. 364-200.000.
Recycled Energy, Inc.: *See—*
Diaz, Manuel C., 4,943,233, Cl. 432-13.000.
Redding, Dwight D., to American National Can Company. Multi-layer sheet structure, method of making same and containers made therefrom. 4,943,780, Cl. 428-35.900.
Reding, Bruce W., to Corning Incorporated. Fiber optic triangulation gage. 4,943,157, Cl. 356-1.000.
Redmerski, Lawrence S.; Pinnow, Kenneth E.; and Eckenrod, John J., to Crucible Materials Corporation. Welded corrosion-resistant ferritic stainless steel tubing having high resistance to hydrogen embrittlement and a cathodically protected heat exchanger containing the same. 4,942,922, Cl. 165-134.100.
Reed Tool Company, Ltd.: *See—*
Barr, John D.; and Wardley, Michael T., 4,942,933, Cl. 175-329.000.
Regen, Steven L., to Lehigh University. Supramolecular surfactants: amphiphilic polymers designed to disrupt lipid membranes. 4,943,624, Cl. 528-301.000.
Rego, Donovan N.: *See—*
Lewis, Thomas W.; Hamill, Paul E., Jr.; Ozgu, Mustafa R.; Padfield, Ralph C.; Rego, Donovan N.; and Brita, Guido P., 4,942,986, Cl. 222-590.000.
Reid, Ray D.: *See—*
Campbell, Albert E.; Hug, William F.; and Reid, Ray D., 4,943,928, Cl. 364-477.000.
Reidenbach, John R.; and Schopp, Robert E., to International Business Machines Corporation. Magnetic disk file head suspension assembly mounting means. 4,943,875, Cl. 360-104.000.
Reimer, Alden L. F. Swather hitch device for pull-type implements. 4,943,080, Cl. 280-455.100.
Reimers Getriebe AG: *See—*
Dittrich, Otto, 4,942,786, Cl. 74-867.000.
Reinhard, Donnie K.: *See—*
Asmussen, Jes; and Reinhard, Donnie K., 4,943,345, Cl. 156-643.000.
Reinhart, Robert V., Jr.: *See—*
Page, Mary J.; Hamilton, Benton W.; Skiles, Bruce L.; and Reinhart, Robert V., Jr., 4,943,282, Cl. 604-198.000.
Reinbold, John E.; and Wilsman, James F. Portable headcatch support and animal restraining mechanism. 4,942,846, Cl. 119-103.000.
Reithel, Raymond F.; and Sutton, Richard C., to Eastman Kodak Company. Negative-working dyeable photoresist. 4,943,514, Cl. 430-270.000.
Ren, Fan; and Shah, Nitin J., to AT&T Bell Laboratories. Method for selectively wet etching aluminum gallium arsenide. 4,943,540, Cl. 437-225.000.
Renau, Karol Z.: *See—*
Lyall, Lucian H.; and Renau, Karol Z., 4,943,706, Cl. 219-494.000.
Renold, Inc.: *See—*
Quirk, Michael J.; Drake, Timothy E.; and Zarycki, John E., 4,942,776, Cl. 74-61.000.
Research & Development of North Carolina: *See—*
Lathim, Delbert L.; Liu, Ting; and Foley, Charles F., 4,943,066, Cl. 273-415.000.
Rest, Hartmut: *See—*
Kacza, Martin; Rest, Hartmut; and Born, Eberhard, 4,942,904, Cl. 138-89.000.
Revelj, Ellen J.: *See—*
Ferree, Herbert E.; and Revelj, Ellen J., 4,942,793, Cl. 81-54.000.
Rexham Corporation: *See—*
Ellison, Thomas M.; and Winton, Robert A., 4,943,680, Cl. 427-154.000.
Rexroth, Frederick W.; and Bays, F. Barry, to Concept Inc. Electrolyte purging electrode tip. 4,943,290, Cl. 606-45.000.
Reymann, Wolfgang; Gropp, Heiko-Ulrich; Vogel, Klaus; and Muller, Hartwig, to Krupp Corpoplast Maschinenbau GmbH. Blow molding machine. 4,943,228, Cl. 425-526.000.
Reymann, Wolfgang; Gropp, Heiko-Ulrich; Vogel, Klaus; Muller, Hartwig; and Wiedenfeld, Walter, to Krupp Corpoplast Maschinenbau GmbH. Blow molding machine. 4,943,229, Cl. 425-535.000.
Reynaert, Edward A., to Commu-Tec, Inc. Cable splicing and termination system. 4,943,685, Cl. 174-19.000.
Reynaud, Jean-Claude: *See—*
Beaucoup, Louis; Boncompain, Jean; and Reynaud, Jean-Claude, 4,943,020, Cl. 248-124.000.
Reynolds, Mary B.: *See—*
Laundre', John W.; Reynolds, Timothy D.; and Reynolds, Mary B., 4,943,125, Cl. 350-96.100.
Reynolds, Timothy D.: *See—*
Laundre', John W.; Reynolds, Timothy D.; and Reynolds, Mary B., 4,943,125, Cl. 350-96.100.
Rhodes, R. Gale, Jr.: *See—*
Fuchs, Francis J., Jr., 4,942,751, Cl. 72-68.000.
Rhodes, Richard D., Jr., to Davidson Textron Inc. Variations adjustment mechanism for instrument panels. 4,943,107, Cl. 296-70.000.
Rhone-Poulenc Chimie: *See—*
Aviron-Violet, Paul; and Gervais, Christian, 4,943,679, Cl. 562-561.000.
Charmot, Dominique; and Fiard, Jean-Francois, 4,943,482, Cl. 428-407.000.
Rhone-Poulenc Industries: *See—*
Khaladji, Jean; and Peltier, Marcel, 4,942,697, Cl. 51-283.00R.
Ribbins, Robert C., III: *See—*
Sahatjian, Ronald A.; Ribbins, Robert C., III; and Steckel, Mark G., 4,943,473, Cl. 428-245.000.
Rice, Thomas B., to Hughes Aircraft Company. Digital interface unit. 4,943,978, Cl. 375-1.000.
Rich, Jonathan D.: *See—*
Gross, David C.; Haig, Connie L.; and Rich, Jonathan D., 4,943,596, Cl. 521-82.000.
Richard, Robert G.: *See—*
Shankland, Ian R.; Richard, Robert G.; and Lund, Earl A. E., 4,943,388, Cl. 252-69.000.
Richards, Gaylord W.: *See—*
Hwang, Frank K.; and Richards, Gaylord W., 4,944,029, Cl. 340-825.800.
Richardson, Richard W., to Ohio State University, The. Apparatus and methods for controlling a welding process. 4,943,702, Cl. 219-124.340.
Richardson, Russell D.: *See—*
Stewart, John F.; and Richardson, Russell D., 4,942,791, Cl. 81-177.100.
Richeson, William E.; and Erickson, Frederick L., to Magnavox Government and Industrial Electronics Company. Electro-pneumatic actuator. 4,942,852, Cl. 123-90.140.
Richter, Siegfried; Schauer, Friedrich; and Bauernfeind, Peter, to Kabelmetal Electro GmbH. Safety apparatus for a motor driven window. 4,943,757, Cl. 318-468.000.
Rick, Bernard J.: *See—*
Nesser, Thomas A.; Nesser, Deborah L.; Luckower, Herbert; Barczak, John P.; Joslyn, Edward P.; and Rick, Bernard J., 4,942,954, Cl. 194-351.000.
Ricoh Company, Ltd.: *See—*
Imao, Kaoru; and Watanabe, Hideyuki, 4,944,023, Cl. 382-37.000.
Kumano, Masafumi; and Yamamoto, Kenji, 4,943,839, Cl. 357-30.000.
Manabe, Yoshiharu; and Sakamoto, Koji, 4,943,828, Cl. 355-200.000.
Takada, Hiromi; Suzuki, Takami; Shiina, Toshio; Okamoto, Keiji; Komurasaki, Takeshi; Yoshioka, Satoru; Sakuma, Nobuo; and Matsuura, Tadashi, 4,943,128, Cl. 350-6.900.
Yasujima, Kenji; and Hashimoto, Masao, 4,944,022, Cl. 382-14.000.
Yoshino, Hirobumi; Ito, Takashige; Kawase, Junichi; and Maeda, Hiroyuki, 4,944,031, Cl. 355-206.000.
Ricoh Research Institute of General Electronics: *See—*
Kumano, Masafumi; and Yamamoto, Kenji, 4,943,839, Cl. 357-30.000.
Riemen, Mark W.: *See—*
Heimbrook, David C.; Riemen, Mark W.; Oliff, Allen; and Saari, Walfred S., 4,943,561, Cl. 514-17.000.
Rietveld, Krijn: *See—*
Van den Berg, Johan A.; Van Ooyen, Albert J. J.; and Rietveld, Krijn, 4,943,529, Cl. 435-172.300.
Riley, Brian, to United States of America, Energy. Solid oxide fuel cell matrix and modules. 4,943,494, Cl. 429-30.000.
Riley, Russell B.: *See—*
Szente, Pedro A.; and Riley, Russell B., 4,943,764, Cl. 324-95.000.
Riley, William M.: *See—*
Hatch, Frederick R.; Riley, William M.; and Banks, Thomas M., 4,943,068, Cl. 277-23.000.
Rinaldi, Anthony W.: *See—*
Linkow, Leonard I.; Rinaldi, Anthony W.; and Gambale, Michael, 4,943,236, Cl. 433-165.000.
Rinderer, Eric R., to B-Line Systems, Inc. Bracket for mounting an electrical box on a wall stud. 4,943,022, Cl. 248-205.100.
Ritter, Rodney L.: *See—*
Sinkunas, Peter J.; Ritter, Rodney L.; and Altpeter, James E., 4,942,997, Cl. 228-56.100.
Robbins, Gregory M.: *See—*
Zittel, David R.; and Robbins, Gregory M., 4,942,810, Cl. 99-477.000.
Robert Bosch GmbH: *See—*
Armbruster, Franz; Bauer, Carsten; and Meyer, Friedhelm, 4,943,687, Cl. 174-94.00R.
Jaki, Friedrich; and Brammer, Hartmut, 4,942,856, Cl. 123-146.50A.
Robinson, Colin, to Glaxo Group Limited. Ceftazidime dihydrochloride formic acid solvates. 4,943,632, Cl. 540-225.000.
Rocholl, Hans; and Klein, Horst, to Bergische Stahl-Industrie. Brake cylinder. 4,942,945, Cl. 188-202.000.
Rockwell International Corporation: *See—*
Hawkinson, Elden L., 4,942,653, Cl. 29-890.010.
Rodgers, Cyril: *See—*
Fay, Fredric S.; Fogarty, Kevin E.; and Rodgers, Cyril, 4,943,142, Cl. 350-315.000.
Roemmich, Bruce D.: *See—*
Cannon, Thomas G.; Roemmich, Bruce D.; and Precht, Terry A., 4,943,877, Cl. 360-106.000.
Roggwiller, Peter, to BBC Brown, Boveri & Company, Limited. Reverse-conducting thyristor. 4,943,840, Cl. 357-39.000.

Rohde, Thomas D.: *See*—
Wigness, Bruce D.; and Rohde, Thomas D., 4,943,560, Cl. 514-11.000.

Rohm GmbH: *See*—
Christner, Juergen; Pfleiderer, Ernst; Taeger, Tilman; and Bernschein, Ursula, 4,943,530, Cl. 435-188.000.

Rohm and Haas Company: *See*—
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ROJ Electrotex S.p.A.: *See*—
Ghiardo, Fiorenzo, 4,942,909, Cl. 139-370.200.

Rokicki, Andrzej, to Air Products and Chemicals, Inc.; Arco Chemical Company; and Mitsui Petrochemical Industries, Ltd. Making poly-(alkylene carbonates) of controlled molecular weight. 4,943,677, Cl. 528-405.000.

Rolph, Randy K.: *See*—
Bardai, Zaher; Rolph, Randy K.; Lamb, Arlene E.; Longo, Robert T.; Manoly, Arthur E.; and Forman, Ralph, 4,943,343, Cl. 156-643.000.

Romein, Daniel C. Light-weight folding massage table. 4,943,041, Cl. 269-322.000.

Rommi, Heikki P. J.: *See*—
Jarvinen, Markku S.; Novaky, Mikael J. H.; and Rommi, Heikki P. J., 4,942,769, Cl. 73-82.100.

Romuss, Christiane: *See*—
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Roney, Don G.: *See*—
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Roos, Leo: *See*—
Lipson, Melvin A.; Carter, Thomas P.; Shelnut, James G.; and Roos, Leo, 4,943,513, Cl. 430-260.000.

Roper, Hartmut: *See*—
Schmitt, Holm; Henken, Fritz; Roper, Hartmut; and Heider, Peter, 4,943,265, Cl. 474-25.000.

Rosa, Rudy, to Barry Robertson; and Rosa, Rudy. Hand sanitizing station. 4,942,631, Cl. 4-623.000.

Roscart, Charles W. Rails of an inserter machine. 4,943,044, Cl. 271-248.000.

Rosen, John B. Reflected glare-shielding vehicular apparatus. 4,943,103, Cl. 296-97.100.

Rosen, Jonathan I.; and Warner, John F., to Ortho Pharmaceutical Corporation. HIV peptide-inducted T cell stimulation. 4,943,628, Cl. 530-326.000.

Rosenthal, Sallie W., to ConAgra, Inc. Bread crumb coating composition and process for imparting fried-like texture and flavor to food products. 4,943,438, Cl. 426-92.000.

Rossanigo, Cesare, to So.Re.Ma. Operatrici Ferroviarie Snc di Cesare Rossanigo & C. Tamping machine, particularly for railroad ballasts. 4,942,821, Cl. 104-12.000.

Roth, Monica J.: *See*—
Goff, Stephen P.; Tanese, Naoko; and Roth, Monica J., 4,943,531, Cl. 435-194.000.

Rouffet, Denis: *See*—
Dulck, Jean-Francois; and Rouffet, Denis, 4,943,808, Cl. 342-356.000.

Rousey, William S.: *See*—
Aldrich, Charles S.; Craft, James A.; Harden, James P.; Komplin, Steven R.; Rousey, William S.; Shah, Praful M.; Ward II, Earl D.; Wilzbach, Bernard L.; and King, Terry L., 4,943,815, Cl. 346-108.000.

Roussel Uclafi: *See*—
Nedelec, Lucien; Nique, Francois; Philibert, Daniel; Moguilewsky, Martine; and Bouton, Marie-Madeleine, 4,943,566, Cl. 514-179.000.

Rowcliffe, David J.: *See*—
Allam, Ibrahim M.; and Rowcliffe, David J., 4,943,485, Cl. 428-457.000.

Rowley, William W. Strap hanger. 4,942,644, Cl. 24-16.0PB.

Roy, Carl W., II: *See*—
Willoughby, Brian D.; and Roy, Carl W., II, 4,943,885, Cl. 361-232.000.

Ruder, Fred A., Sr. Horizontal cutting machine. 4,942,725, Cl. 56-16.900.

Rudnick, Leslie R.: *See*—
Avery, Noyes L.; Horodysky, Andrew G.; Law, Derek A.; and Rudnick, Leslie R., 4,943,383, Cl. 252-52.00A.

Rudolf, Karl: *See*—
Thoma, Klaus; Lindstadt, Klaus; and Rudolf, Karl, 4,942,819, Cl. 102-476.000.

Rudov, David. Pharmacological/cosmetic preparation. 4,943,433, Cl. 424-195.100.

Rumsey, Roger L., to Balco International, Inc. Fire-rated expansion joint having three degrees of freedom. 4,942,710, Cl. 52-396.000.

Rupp, Karl-Heinz: *See*—
Hellmann, Jens-Holger; Holscher, Richard; Janssen, Hermann J.; Kleemann, Alfred; Rupp, Karl-Heinz; Schwarz, Joachim; Varges, Gunter; and Waas, Heinrich, 4,942,837, Cl. 114-40.000.

Rushton, Alan, to British Nuclear Fuels PLC. Removal of thorium from raffinate. 4,943,318, Cl. 423-10.000.

Rutgerswerke AG: *See*—
Boenigk, Winfried; Zander, Maximilian; and Stadelhofer, Jurgen, 4,943,365, Cl. 208-44.000.

Ryan, Hunter D., Jr.: *See*—
Todd, Wayne A.; and Ryan, Hunter D., Jr., 4,942,706, Cl. 52-234.000.

Rybalka, Borys: *See*—
Komerska, James; Petito, George; and Rybalka, Borys, 4,943,462, Cl. 428-42.000.

Rybicki, Mathew A., to Motorola, Inc. Frequency stable digitally controlled driver circuit. 4,943,784, Cl. 330-284.000.

Ryder International Corporation: *See*—
Rabenau, Richard; Kanner, Rowland W.; and Cerola, Joseph J., 4,943,704, Cl. 219-275.000.

Ryobi Ltd.: *See*—
Aoki, Atsuhito, 4,943,012, Cl. 242-290.000.

S R I International: *See*—
Allam, Ibrahim M.; and Rowcliffe, David J., 4,943,485, Cl. 428-457.000.

Saari, Walfred S.: *See*—
Heimbrook, David C.; Riemen, Mark W.; Oliff, Allen; and Saari, Walfred S., 4,943,561, Cl. 514-17.000.

Sabbioni, Giuseppina, to A. S. T. Automatismi Speciali Termoplastici S.r.l. Granulation chamber for extruders of materials such as plastics. 4,943,218, Cl. 425-10.000.

Sadamatsu, Shigeru: *See*—
Aoki, Takayoshi; Ishii, Yukihiro; Tanaka, Koichi; and Sadamatsu, Shigeru, 4,943,505, Cl. 430-109.000.

Sahatjian, Ronald A.; Ribbins, Robert C., III; and Steckel, Mark G., to Chemical Fabrics Corporation. Flexible laminated fluoropolymer-containing composites. 4,943,473, Cl. 428-245.000.

Saito, Shinichi: *See*—
Inoue, Hiromichi; Inukai, Takashi; Saito, Shinichi; Miyazawa, Kazutoshi; and Ohno, Kouji, 4,943,385, Cl. 252-299.610.

Saito, Shinji: *See*—
Imamiya, Keniti; Tanaka, Sumio; Miyamoto, Junichi; Atsumi, Shigeru; Ohtsuka, Nobuaki; and Saito, Shinji, 4,943,962, Cl. 365-230.080.

Saito, Yasuo: *See*—
Endo, Shigeo; Kawashima, Haruo; Hirata, Kimio; Saito, Yasuo; Uchiya, Takao; and Yanagi, Hideo, 4,943,398, Cl. 264-82.000.

Saitou, Norio: *See*—
Ando, Kimiaki; Ooyama, Mitsuo; and Saitou, Norio, 4,943,729, Cl. 250-492.300.

Sakaba, Hideo: *See*—
Utsunomiya, Kazuhiro; Ooyama, Nobumi; and Sakaba, Hideo, 4,943,683, Cl. 376-245.000.

Sakagami, Seiji: *See*—
Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, 4,943,716, Cl. 250-231.160.

Sakaguchi, Akihiro; Kaneko, Noriyuki; Saruta, Toshio; and Sawano, Ryotaro, to Bridgestone Corporation. Method for production of liquid center ball for golf ball. 4,943,332, Cl. 156-146.000.

Sakaguchi, Michiaki: *See*—
Kumagai, Motoo; Kato, Keiichi; Nagano, Masato; and Sakaguchi, Michiaki, 4,943,469, Cl. 428-209.000.

Sakai, Jun; Higashiyama, Shunichi; Suzuki, Koji; and Ohta, Mitsuru, to Brother Kogyo Kabushiki Kaisha. Recording system having a coating device for coating recording medium or photosensitive medium with developer material reacting with color precursor. 4,943,509, Cl. 430-138.000.

Sakai, Masanori: *See*—
Ohwada, Akira; Sakai, Masanori; and Tsutsumi, Yasuhisa, 4,943,116, Cl. 297-362.000.

Sakai, Osamu: *See*—
Shinoda, Takashi; and Sakai, Osamu, 4,943,967, Cl. 371-2.200.

Sakai, Shoji: *See*—
Morihashi, Toshifumi; Sakai, Shoji; Nakayama, Teruo; Noda, Koshi; and Fujiwara, Michiaki, 4,942,731, Cl. 57-328.000.

Sakai, Takao; and Hamaguri, Kenji, to Minolta Camera Kabushiki Kaisha. Device for measuring oxygen saturation degree in arterial blood. 4,942,877, Cl. 128-633.000.

Sakakibara, Toshimori: *See*—
Okuri, Yasuhiro; and Sakakibara, Toshimori, 4,943,604, Cl. 523-428.000.

Sakama, Mitsunori; Fukada, Takeshi; Sakamoto, Naoya; Amachi, Nobumitsu; Hayashi, Shigenori; and Inushima, Takashi, to Semiconductor Energy Laboratory Co., Ltd. Image sensor and manufacturing method for the same. 4,943,710, Cl. 250-208.100.

Sakamoto, Keiji; and Yoshida, Osamu, to Fanuc Ltd. Multiple-articulated robot control apparatus. 4,943,759, Cl. 318-568.110.

Sakamoto, Koji: *See*—
Manabe, Yoshiharu; and Sakamoto, Koji, 4,943,828, Cl. 355-200.000.

Sakamoto, Makoto: *See*—
Sato, Takeshi; Miyazaki, Shuji; Sakamoto, Makoto; and Ando, Motonori, 4,943,681, Cl. 430-495.000.

Sakamoto, Minoru: *See*—
Okamoto, Kaizo; Ichihara, Akira; Sato, Akimune; Hirata, Kenji; Hirayama, Katsuhisa; Hina, Eiji; Nakaji, Shigeru; Sakamoto, Minoru; Tanaka, Takashi; and Shimizu, Keizo, 4,942,773, Cl. 73-864.450.

Sakamoto, Naoya: *See*—
Sakama, Mitsunori; Fukada, Takeshi; Sakamoto, Naoya; Amachi, Nobumitsu; Hayashi, Shigenori; and Inushima, Takashi, 4,943,710, Cl. 250-208.100.

Sakamoto, Shunichiro: *See*—
Hatanaka, Yuji; Okamoto, Hiroo; Wakumura, Shin-ichi; Miyake, Ichiro; and Sakamoto, Shunichiro, 4,943,964, Cl. 371-31.000.

Sakui, Koji; Fuse, Tsuneaki; and Masuoka, Fujio, to Kabushiki Kaisha Toshiba. Semiconductor memory using dynamic ram cells. 4,943,944, Cl. 365-189.050.

Sakuma, Ichiro: *See*—
Funakubo, Hiroyasu; Dohi, Takeyoshi; Sakuma, Ichiro; and Komeda, Takashi, 4,943,296, Cl. 606-166.000.

Sakuma, Nobuo: *See*—
Takada, Hiromi; Suzuki, Takami; Shiina, Toshio; Okamoto, Keiji; Komurasaki, Takeshi; Yoshioka, Satoru; Sakuma, Nobuo; and Matsuura, Tadashi, 4,943,128, Cl. 350-6.900.

Sakura, Kathuhiko; Takeuchi, Genki; and Takeshita, Naoko, to Nippon Steel Chemical Co., Ltd. Method of making ethylbiphenyls. 4,943,553, Cl. 585-471.000.

Sakurai, Hiromi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Wheel mounting apparatus for automobiles. 4,942,659, Cl. 29-705.000.

Sakurai, Seiya: *See*—
Nozaki, Hisashi; and Sakurai, Seiya, 4,943,444, Cl. 426-573.000.

Sakurai, Shunichiro: *See*—
Hidaka, Hiroyoshi; Tanaka, Toshio; Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Mitani, Kazuya; and Sakurai, Shunichiro, 4,943,581, Cl. 514-307.000.

Saloff, David: *See*—
Saloff, William S.; and Saloff, David, 4,942,634, Cl. 5-450.000.

Saloff, William S.; and Saloff, David, to Lumex, Inc. Damped fluid displacement support system and method for making the same. 4,942,634, Cl. 5-450.000.

Salomon, S.A.: *See*—
Benoit, Louis; and Nerrinck, Bernard, 4,942,681, Cl. 36-119.000.
Morell, Joseph, 4,943,059, Cl. 273-80.100.

Salzgitter AG: *See*—
Willeke, Horst, 4,942,753, Cl. 72-178.000.

Samiotes, Nicholas G.; and Lucas, Paul, to C. R. Bard, Inc. Medical pump with infusion controlled by a detachable coded label. 4,943,279, Cl. 604-151.000.

Sanden Corporation: *See*—
Shimizu, Mitsuo; Maehara, Kazuo; Shinohara, Hidenobu; and Kojima, Hideo, 4,943,003, Cl. 237-2.00B.

Sanders, Norman C., Jr.: *See*—
Montoya, Maria T.; Norman, Alan B.; Sanders, Norman C., Jr.; and Creamer, Glenn E., 4,942,888, Cl. 131-359.000.

Sandling, Michael J.: *See*—
Radovan, Giuseppe; Blaseck, Klaus; Hoffmeister, Lothar; Westendorf, Helmut; Sandling, Michael J.; and Davidson, James W., 4,942,897, Cl. 137-454.200.

Sandvik Aktiebolag: *See*—
Ingelstrom, Nils A., 4,943,543, Cl. 501-96.000.

Sanger, Sampson D., to Naim, Yehuda. Manually operable personal convenience implement. 4,943,097, Cl. 294-19.100.

Sankyo Oilless Industry, Inc.: *See*—
Nakamura, Susumu, 4,942,797, Cl. 83-76.900.

Sano, Kazuhiko: *See*—
Nakamoto, Mitsuharu; Sano, Kazuhiko; and Kawasawa, Takashi, 4,943,555, Cl. 503-227.000.

Sano, Masaaki; Imagawa, Takao; Nishioka, Kouichi; Narishige, Shinji; Hanazono, Masanobu; Onishi, Takashi; and Yoshida, Toshihiro, to Hitachi, Ltd. Quarternary amorphous magnetic alloy thin film and magnetic head including same. 4,943,883, Cl. 360-126.000.

Sano, Yasuro; and Nakamura, Takashi, to Janome Sewing Machine Co., Ltd. Liquid crystal indicating device in a sewing machine. 4,942,836, Cl. 112-445.000.

Sanofi: *See*—
Nisato, Dino; and Frigerio, Marco, 4,943,641, Cl. 548-953.000.

Sanshin Kagyo Kabushiki Kaisha: *See*—
Boyer, Kirk A.; and Yonezawa, Shigeki, 4,942,838, Cl. 114-345.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Nakamura, Kazuhiro; Yoshioka, Tatsuya, Sawada, Ryoji; and Nakamura, Tomoji, 4,943,777, Cl. 324-433.000.

Santasalo, Lauri; and Huhta-Koivisto, Esko, to Oy Santasalo-Sohlberg AB. Generation and accumulation of steam. 4,942,847, Cl. 122-35.000.

Sanyo Electric Co., Ltd.: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,943,916, Cl. 364-200.000.
Ikeda, Masami; Yamada, Yasuhiro; Tuji, Mahito; Tamano, Akimasa; and Mizoguchi, Yasunari, 4,943,800, Cl. 340-567.000.
Ishiguro, Kazuhisa; and Yamagishi, Mikio, 4,944,010, Cl. 381-4.000.

Saotome, Shigeru; and Ishida, Masamitsu, to Fuji Photo Film Co., Ltd. Radiation image recording and read-out apparatus. 4,943,724, Cl. 250-327.200.

Sargeant, Robert B.: *See*—
Eisinger, Robert W.; Khalil, Mohammed H.; Katz, David H.; and Sargeant, Robert B., 4,943,522, Cl. 435-7.000.

Sarin, Vinod K., to GTE Laboratories Incorporated. Method for depositing nitride-based composite coatings by CVD. 4,943,450, Cl. 427-255.200.

Saruta, Toshio: *See*—
Sakaguchi, Akihiro; Kaneko, Noriyuki; Saruta, Toshio; and Sawano, Ryotaro, 4,943,332, Cl. 156-146.000.

Sarwinski, Raymond E.: *See*—
Breneman, Bruce C.; Parker, J. Wesley; and Sarwinski, Raymond E., 4,943,774, Cl. 324-318.000.

Sasaki, Kenji; Matsushita, Mitsuo; Ono, Kenzo; Horiwaki, Akihiro; Fujii, Katsunori; and Hatano, Hiroyuki, to Mita Industrial Co., Ltd. Image forming apparatus. 4,943,829, Cl. 355-215.000.

Sasaki, Noriaki; and Matsunaka, Kazuhisa, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Process of vitrifying radioactive liquid waste with suppressed formation of gaseous ruthenium. 4,943,395, Cl. 252-629.000.

Sasaki, Takanobu, to Nippon Seiko Kabushiki Kaisha. Warning device for passive seat belt system. 4,943,087, Cl. 280-804.000.

Sasaki, Takashi: *See*—
Sugisawa, Masanori; Sasaki, Takashi; and Nishimoto, Yoshihito, 4,943,360, Cl. 204-182.300.

Satchell, Donald P., Jr.: *See*—
Ramachandran, Ramakrishnan; Andrecovich, Mark J.; MacLean, Donald L.; and Satchell, Donald P., Jr., 4,943,650, Cl. 558-319.000.

Sato, Akimune: *See*—
Okamoto, Kaizo; Ichihara, Akira; Sato, Akimune; Hirata, Kenji; Hirayama, Katsuhisa; Hina, Eiji; Nakaji, Shigeru; Sakamoto, Minoru; Tanaka, Takashi; and Shimizu, Keizo, 4,942,773, Cl. 73-864.450.

Sato, Fumitaka, to Kabushiki Kaisha Toshiba. Apparatus and method for plotting curved figures represented by high order functions in a bit map. 4,943,935, Cl. 364-518.000.

Sato, Gordon: *See*—
Mendelsohn, John; Kawamoto, Tomoyuki; Sato, Gordon; and Sato, J. Denry, 4,943,533, Cl. 435-240.270.

Sato, Hideo: *See*—
Kawabata, Hiroshi; Kobayashi, Katsuhiko; and Sato, Hideo, 4,943,512, Cl. 430-197.000.

Sato, Hiroki; and Seto, Yoshiki, to Neturen Company Limited. Method and apparatus for isothermal holding of wire when a wire is heat-treated in-line. 4,943,036, Cl. 266-104.000.

Sato, J. Denry: *See*—
Mendelsohn, John; Kawamoto, Tomoyuki; Sato, Gordon; and Sato, J. Denry, 4,943,533, Cl. 435-240.270.

Sato, Masaaki: *See*—
Uda, Akira; Yoshida, Yoshio; Harada, Makoto; and Sato, Masaaki, 4,942,739, Cl. 62-93.000.

Sato, Masaru; and Tsukane, Nagayoshi, to Daicel Chemical Industries, Ltd. High-density information recording carrier. 4,943,957, Cl. 428-694.000.

Sato, Michitaka: *See*—
Miyashita, Tsuneo; Nishio, Hiroaki; and Sato, Michitaka, 4,943,403, Cl. 264-233.000.

Sato, Seishiro: *See*—
Nakao, Ken; Sato, Seishiro; and Ohkase, Wataru, 4,943,235, Cl. 432-205.000.

Sato, Takeshi; Miyazaki, Shuji; Sakamoto, Makoto; and Ando, Motonori, to Toyo Ink Manufacturing Co., Ltd. Optical recording medium and process for the production thereof. 4,943,681, Cl. 430-495.000.

Sato, Vicki L.: *See*—
Gilbert, Walter; Fisher, Richard A.; Sato, Vicki L.; and Leban, Johann J., 4,943,627, Cl. 530-324.000.

Satoh, Masaharu: *See*—
Fukunaga, Yukio; Fukushima, Naoto; Akatsu, Yohsuke; Hano, Sunao; and Satoh, Masaharu, 4,943,084, Cl. 280-707.000.

Satou, Masaharu: *See*—
Arai, Masatoshi; Fujioka, Kazutoshi; and Satou, Masaharu, 4,943,613, Cl. 524-773.000.

Sauber, Charles J.; and Truhler, Janet E. Buoyant structures in contact lens case. 4,942,959, Cl. 206-5.100.

Sauerwald, Manfred: *See*—
Dockner, Toni; Sauerwald, Manfred; Krug, Herbert; and Irgang, Matthias, 4,943,671, Cl. 585-642.000.

Saunders, Thomas A. Arrow insert. 4,943,067, Cl. 273-416.000.

Sauter, Hubert: *See*—
Schulz, Guenter; Schubert, Juergen; Sauter, Hubert; Grosmann, Klaus; and Jung, Johann, 4,943,315, Cl. 71-120.000.

Savage, Michael A.: *See*—
Piosenka, Gerald V.; Worger, William R.; and Savage, Michael A., 4,944,008, Cl. 380-46.000.

Saveliev, Sergei V.: *See*—
Saveliev, Viktor S.; Yablokov, Evgeny G.; Prokubovsky, Vladimir I.; Kolody, Stepan M.; Saveliev, Sergei V.; and Smirnov, Ary A., 4,943,297, Cl. 606-200.000.

Saveliev, Viktor S.; Yablokov, Evgeny G.; Prokubovsky, Vladimir I.; Kolody, Stepan M.; Saveliev, Sergei V.; and Smirnov, Ary A. Device for preparation of intravenous filter for implantatioa. 4,943,297, Cl. 606-200.000.

Sawada, Kiyoshi: *See*—
Kato, Kunioki; Kawamura, Masao; Goda, Hiroshi; Sawada, Kiyoshi; and Hamatani, Kazuhiro, 4,943,655, Cl. 562-46.000.

Sawada, Ryoji: *See*—
Nakamura, Kazuhiro; Yoshioka, Tatsuya; Sawada, Ryoji; and Nakamura, Tomoji, 4,943,777, Cl. 324-433.000.

Sawano, Ryotaro: *See*—
Sakaguchi, Akihiro; Kaneko, Noriyuki; Saruta, Toshio; and Sawano, Ryotaro, 4,943,332, Cl. 156-146.000.

Sawazaki, Kenji: *See*—
Kamayachi, Yuichi; Sawazaki, Kenji; Suzuki, Morio; and Inagaki, Shoji, 4,943,516, Cl. 430-280.000.

Sawruk, Stephen D. Fragmentation device. 4,942,820, Cl. 102-482.000.

Saxby, Michael E., to Comte de Lalaing. Training or marking bullets. 4,942,818, Cl. 102-444.000.

Sayles, David C. Non-shrinking, dimensionally-stable modified epoxy resins. 4,943,610, Cl. 525-415.000.

Scamans, Geoffrey M.: *See*—
Holroyd, Nigel J. H.; and Scamans, Geoffrey M., 4,943,492, Cl. 428-654.000.

Scamehorn, John F.; and Harwell, Jeffrey H. Surfactant enhanced regeneration of hydrophobic materials. 4,943,376, Cl. 210-674.000.

Scan Coin AB: *See*—
Nilsson, Bengt G.; and Lindahl, Bengt G., 4,943,257, Cl. 453-9.000.

Schack, Warren R.; and Powers, Richard G., to Marlen Research Corporation. Method and apparatus for crust-freezing and slicing of comminuted meat products. 4,943,442, Cl. 426-513.000.

Schaffer, Stephen P.: *See*—
Ingersoll, Clyde E.; Schaffer, Stephen P.; and McCabe, Patrick J., 4,943,483, Cl. 428-433.000.

Schaltenbrand, Robert W.; Seman, Brian; and Shepherd, Donald, to Benshaw, Inc. Solid state motor starter. 4,943,890, Cl. 361-388.000.

Schar, Hugo, to BBC Brown Boveri AG. Therapy simulator. 4,943,990, Cl. 378-152.000.

Schaub, Norbert: *See*—
Schober, Karl; and Schaub, Norbert, 4,942,762, Cl. 73-117.000.

Schauer, Friedrich: *See*—
Richter, Siegfried; Schauer, Friedrich; and Bauernfeind, Peter, 4,943,757, Cl. 318-468.000.

Scherer, Kirby V., Jr.; Yamanouchi, Kouichi; Yokoyama, Kazumasa; and Naito, Ryoichi, deceased (by Naito, Kimie, executor), to Green Cross Corporation, The. Perfluorochemicals and process for preparing the same. 4,943,595, Cl. 514-722.000.

Schering Aktiengesellschaft: *See*—
Angermann, Alfred; Franke, Helga; and Johann, Gerhard, 4,943,310, Cl. 71-88.000.
von Angerer, Erwin, 4,943,572, Cl. 514-235.200.

Scherzinger, William M.; Chu, Tsuwei; and Kasdan, Leon M., to Allied-Signal Inc. Liquid cooled salient pole rotor support wedges. 4,943,746, Cl. 310-61.000.

Schilo, Diederich; and Birkenfeld, Willi, to Akzo N.V. Polyether imide fibers. 4,943,481, Cl. 428-373.000.

Schittenheim, Helge: *See*—
Hoffmann, Martin; Schittenheim, Helge; Wierschem, Franz-Rudolf; and Eichhorn, Horst, 4,943,028, Cl. 248-548.000.

Schlamp, Guenther; Gall, Klaus P.; Langer, Adolf; and Ptaschek, Georg, to Demetron Gesellschaft fuer Elektronik-Werkstoffe m.b.H. Sputtering target for producing optically transparent layers and method of manufacturing these targets. 4,943,362, Cl. 204-298.130.

Schlecht, Martin F.: *See*—
Howe, Roger T.; Lang, Jeffrey H.; Schlecht, Martin F.; Schmidt, Martin A.; and Senturia, Stephen D., 4,943,750, Cl. 310-309.000.

Schlemmer, Lothar: *See*—
Taubitz, Christof; Gausepohl, Hermann; Seiler, Erhard; Boehlke, Klaus; and Schlemmer, Lothar, 4,943,399, Cl. 264-101.000.

Schlinsog, Hans-Jurgen: *See*—
Patzschke, Hans-Peter; Luttenberg, Albrecht; Schlinsog, Hans-Jurgen; and Bogdan, Wolfgang, 4,943,359, Cl. 204-181.600.

Schlosser, Erich J.: *See*—
Alden, J. Michael; Schlosser, Erich J.; and Stephen, James C., 4,942,862, Cl. 126-337.00R.

Schlumberger Technologies, Inc.: *See*—
Beaucoup, Louis; Boncompain, Jean; and Reynaud, Jean-Claude, 4,943,020, Cl. 248-124.000.

Schmidt, Martin A.: *See*—
Howe, Roger T.; Lang, Jeffrey H.; Schlecht, Martin F.; Schmidt, Martin A.; and Senturia, Stephen D., 4,943,750, Cl. 310-309.000.

Schmitt, Holm; Henken, Fritz; Roper, Hartmut; and Heider, Peter, to Ford Motor Company. Device for transmitting an adjustable position of a drivebelt pulley in a continually variable transmission. 4,943,265, Cl. 474-25.000.

Schmitt, M. Norbert. Drilling and thread-milling tool and method. 4,943,191, Cl. 408-1.00R.

Schnedl, Edwin F. Dipstick locator and wiper construction for automobiles. 4,942,669, Cl. 33-725.000.

Schneider, Bernard, to Cebal. Tube for the distribution of a paste with stripes comprising a one-piece head with a double skirt. 4,942,981, Cl. 222-94.000.

Schneider, Bernardus J. J. A. Bottle rack component and assembly. 4,942,967, Cl. 211-74.000.

Schnorr, Claus: *See*—
Micali, Silvio; and Schnorr, Claus, 4,944,009, Cl. 380-46.000.

Schober, Karl; and Schaub, Norbert, to Daimler-Benz AG. Flat unit for motor vehicle test beds. 4,942,762, Cl. 73-117.000.

Schoen, Jelle P.: *See*—
Lefebvre, Byron; and Schoen, Jelle P., 4,943,352, Cl. 196-46.100.

Schoenwald, Siegfried, to Siemens Aktiengesellschaft. Multi-stage lateral channel compressor. 4,943,208, Cl. 415-175.000.

Schoepke, Holger: *See*—
Brueckmann, Ralf; Leitner, Heinz; and Schoepke, Holger, 4,943,602, Cl. 524-600.000.

Schopp, Robert E.: *See*—
Reidenbach, John R.; and Schopp, Robert E., 4,943,875, Cl. 360-104.000.

Schorr, Hans P.: *See*—
Markbreiter, Stephen J.; Dessanti, Daniel J.; and Schorr, Hans P., 4,942,734, Cl. 60-39.020.

Schreiner, Ceinwen A.: *See*—
Blackburn, Gary R.; Mackerer, Carl R.; and Schreiner, Ceinwen A., 4,943,521, Cl. 435-6.000.

Schrod, Josef: *See*—
Gerstner-Stevens, Ditmar; and Schrod, Josef, 4,943,009, Cl. 242-42.000.

Schroder, Franz; and Strutz, Gerd, to Gebr. Happich GmbH. Method of manufacturing a profiled strip with smooth reinforcing insert. 4,943,335, Cl. 156-244.180.

Schroeder, Kenneth H.: *See*—
Evans, Francis E.; Schroeder, Kenneth H.; and Wagner, William J., 4,943,423, Cl. 423-293.000.

Schubert, Juergen: *See*—
Schulz, Guenter; Schubert, Juergen; Sauter, Hubert; Grosmann, Klaus; and Jung, Johann, 4,943,315, Cl. 71-120.000.

Schuemann, Wil. Firearm gun rise and muzzle jump reducer. 4,942,801, Cl. 89-14.300.

Schuhmacher, Manfred: *See*—
Zejda, Jaroslav; and Schuhmacher, Manfred, 4,943,363, Cl. 204-298.150.

Schuler, Chester L.: *See*—
Barker, Ronald C.; Schuler, Chester L.; Kiesel, Kenneth C.; and Moxon, Edwin C., 4,943,866, Cl. 358-335.000.

Schultz, Robert H.: *See*—
Shriver, Frank L.; and Schultz, Robert H., 4,942,955, Cl. 198-471.100.

Schultz, Robert S., to Emson Research Inc. 360 degree valve for atomizing pump dispenser. 4,942,985, Cl. 222-376.000.

Schultze, Jurgen, to GKN Cardantec International Gesellschaft fur Antriebstechnik mbH. Bearing assembly for the cross member of a universal joint. 4,943,262, Cl. 464-131.000.

Schulz, Guenter; Schubert, Juergen; Sauter, Hubert; Grosmann, Klaus; and Jung, Johann, to BASF Aktiengesellschaft. Agents for reducing transpiration of plants. 4,943,315, Cl. 71-120.000.

Schulze, Hans; Walz, Klaus; Bartkowiak, Frank; and Jakobs, Karlhans, to Bayer Aktiengesellschaft. Levelling agents for disperse dyeing of polyester: ethoxylate or propoxylate of substituted phenol, emulsifier and carrier. 4,943,299, Cl. 8-610.000.

Schutt, Heinz. Earth moving machine. 4,943,205, Cl. 414-680.000.

Schwartz, Claude: *See*—
Lafforgue, Jean-Jacques; and Schwartz, Claude, 4,943,192, Cl. 408-226.000.

Schwartz, Martin J.: *See*—
Giunta, Richard F.; Becker, Robert D.; Schwartz, Martin J.; Coyle, Richard W.; and Curcuru, Kevin H., 4,943,966, Cl. 371-11.100.

Schwartz, Willis T.: *See*—
Stults, Jeffrey S.; and Schwartz, Willis T., 4,943,642, Cl. 549-241.000.

Schwarz, Hans-Helmut: *See*—
Immel, Otto; Schwarz, Hans-Helmut; and Thiel, Reinhard, 4,943,549, Cl. 502-304.000.

Schwarz, Joachim: *See*—
Hellmann, Jens-Holger; Holscher, Richard; Janssen, Hermann J.; Kleemann, Alfred; Rupp, Karl-Heinz; Schwarz, Joachim; Varges, Gunter; and Waas, Heinrich, 4,942,837, Cl. 114-40.000.

Schweizerische Eidgenossenschaft: *See*—
Monkewitz, Martin; and Oppliger, Erich, 4,942,775, Cl. 73-865.300.

SciMed Life Systems, Inc.: *See*—
Euteneuer, Charles L.; Mattison, Richard C.; Adams, Daniel O.; Hektner, Thomas R.; and Keith, Peter T., 4,943,278, Cl. 604-96.000.

SCM Metal Products, Inc.: *See*—
Miller, Kenneth L., 4,942,984, Cl. 222-309.000.

Scott Paper Company: *See*—
Bogart, Larry; Hipkins, James J.; and Edelson, Nathan A., 4,943,350, Cl. 162-158.000.

Scott, Terence A.; and Yates, Chester R., to Leggett & Platt, Incorporated. Spring bedding product. 4,942,636, Cl. 5-475.000.

Scriber, Chris A.: *See*—
Linstromberg, William J.; Janke, Donald E.; and Scriber, Chris A., 4,942,979, Cl. 221-75.000.

Sealright Company, Inc.: *See*—
Larrison, Owen D., 4,942,974, Cl. 220-214.000.

Seamans, James D.; Welch, James G.; and Gasser, Neal G. Method of presulfiding a hydrotreating catalyst. 4,943,547, Cl. 502-150.000.

Sears Manufacturing Company: *See*—
Brodersen, Cole T.; and Foster, Danny S., 4,943,037, Cl. 267-131.000.

Sebastian, Gabriel. Shirt collar buttoning device. 4,942,646, Cl. 24-40.000.

Seculock B. V.: *See*—
Tel, Teunis, 4,942,831, Cl. 109-29.000.

Sedimayr, Wilhelm: *See*—
Joh, Gunter; and Sedimayr, Wilhelm, 4,942,907, Cl. 138-157.000.

Seewer AG: *See*—
Siegenthaler, Peter; and Zwahlen, Andreas, 4,942,842, Cl. 118-24.000.

Sehr, Willibald: *See*—
Zarniko, Martin; and Sehr, Willibald, 4,943,119, Cl. 299-1.000.

Seifert, Gunilla K. E.; and Matteau, Paul P. Automatic aseptic sampling apparatus. 4,942,770, Cl. 73-864.340.

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Uchiyama, Akira, 4,943,486, Cl. 428-469.000.

Seiko Instruments Inc.: *See*—
Hishiki, Yuji, 4,944,000, Cl. 379-359.000.

Seiler, Erhard: *See*—
Taubitz, Christof; Gausepohl, Hermann; Seiler, Erhard; Boehlke, Klaus; and Schlemmer, Lothar, 4,943,399, Cl. 264-101.000.

Seino, Seiji: *See*—
Shishido, Osamu; Noguchi, Satoru; and Seino, Seiji, 4,942,639, Cl. 15-83.000.

Seino, Shuichi; and Fujino, Tomizo, to Chemipro Kasei Kaisha, Ltd. Method for preparing 2-phenylbenzotriazoles. 4,943,637, Cl. 548-260.000.

Seino, Tatsuo: *See*—
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Seita, Yukio: *See*—
Onishi, Makoto; Seita, Yukio; and Koyama, Noriyuki, 4,943,373, Cl. 210-500.420.

Seitetsu Kagaku Co., Ltd.: *See*—
Kato, Kunioki; Kawamura, Masao; Goda, Hiroshi; Sawada, Kiyoshi; and Hamatani, Kazuhiro, 4,943,655, Cl. 562-46.000.

Sekiba, Toshinobu: *See*—
Sugita, Naomasa; Yotumoto, Yoshiharu; Moriguchi, Kouji; and Sekiba, Toshinobu, 4,943,842, Cl. 357-51.000.

Sekine, Noboru: *See*—
Aoki, Takashi; Terayama, Satoshi; Iwaki, Yoshihisa; Sekine, Noboru; Shimada, Hiroyuki; Takemasa, Nobuo; and Miyake, Junichi, 4,942,787, Cl. 74-867.000.

Sellers, James A.: *See*—
Wilson, Syd R.; Sellers, James A.; and Mattox, Robert J., 4,943,539, Cl. 437-195.000.

Seman, Brian: *See*—
Schaltenbrand, Robert W.; Seman, Brian; and Shepherd, Donald, 4,943,890, Cl. 361-388.000.

Semex Medical, Inc.: *See*—
Komerska, James; Petito, George; and Rybalka, Borys, 4,943,462, Cl. 428-42.000.

Semiconductor Energy Laboratory Co., Ltd.: *See*—
Sakama, Mitsunori; Fukada, Takeshi; Sakamoto, Naoya; Amachi, Nobumitsu; Hayashi, Shigenori; and Imushima, Takashi, 4,943,710, Cl. 250-208.100.

Senk, Gerald B., Jr.: *See*—
Hale, Roger W.; and Senk, Gerald B., Jr., 4,942,916, Cl. 164-186.000.

Sentrol, Inc.: *See*—
Holce, Thomas J.; and Flint, Keith E., 4,943,791, Cl. 335-153.000.

Senturia, Stephen D.: *See*—
Haritonidis, Joseph H.; Senturia, Stephen D.; Warkentin, David J.; and Mehregany, Mehran, 4,942,767, Cl. 73-705.000.
Howe, Roger T.; Lang, Jeffrey H.; Schlecht, Martin F.; Schmidt, Martin A.; and Senturia, Stephen D., 4,943,750, Cl. 310-309.000.

Seto, Yoshiki: *See*—
Sato, Hiroki; and Seto, Yoshiki, 4,943,036, Cl. 266-104.000.

Severin, Jan W.; and De With, Gijsbertus, to U.S. Philips Corporation. Device comprising a temperature sensor. 4,943,559, Cl. 505-1.000.

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Sexton, Robert A.: *See*—
Greer, Larry J.; and Sexton, Robert A., 4,942,815, Cl. 101-352.000.

Sgrigonoli, Gary J.: *See*—
Citta, Richard W.; Gosc, Paul M.; Mutzabaugh, Dennis M.; and Sgrigonoli, Gary J., 4,944,006, Cl. 380-20.000.

SGS-Thomson Microelectronics SA: *See*—
Gloton, Jean-Pierre; and Peres, Philippe, 4,943,464, Cl. 428-76.000.

Shah, Nitin J.: *See*—
Ren, Fan; and Shah, Nitin J., 4,943,540, Cl. 437-225.000.

Shah, Praful M.: *See*—
Aldrich, Charles S.; Craft, James A.; Harden, James P.; Komplin, Steven R.; Rousey, William S.; Shah, Praful M.; Ward II, Earl D.; Wilzbach, Bernard L.; and King, Terry L., 4,943,815, Cl. 346-108.000.

Shankland, Ian R.; Richard, Robert G.; and Lund, Earl A. E., to Allied-Signal Inc. Azeotrope-like compositions of pentafluoroethane; 1,1,1-trifluoroethane; and chlorodifluoromethane. 4,943,388, Cl. 252-69.000.

Shannon, David J., to Pure Water, Inc. Control for modular water distiller. 4,943,353, Cl. 202-181.000.

Sharp Corporation: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,943,916, Cl. 364-200.000.

Sharp Kabushiki Kaisha: *See*—
Kihara, Seiichiro; and Okabayashi, Naonori, 4,943,736, Cl. 307-261.000.
Maeda, Yasutaka; Miyamoto, Tsuyochi; Ueno, Yukihiko; and Washio, Hiromi, 4,943,834, Cl. 355-327.000.
Morio, Tomokazu; Fujimoto, Yoshiji; and Kitoh, Atsunori, 4,944,012, Cl. 381-30.000.
Nojima, Hideo; Kojima, Yoshimi; Imada, Eiji; Matsuyama, Toshiro; Hayakawa, Takashi; Narikawa, Shiro; and Ehara, Shaw, 4,943,503, Cl. 430-66.000.
Ohashi, Kunio; and Nagata, Shoichi, 4,943,826, Cl. 355-27.000.

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Shekleton, Jack R., to Sundstrand Corporation. Fuel injector for achieving smokeless combustion reactions at high pressure ratios. 4,943,230, Cl. 431-183.000.

Shell Oil Company: *See*—
Dewitz, Thomas S., 4,943,190, Cl. 406-134.000.
Goodall, Brian L.; Terlouw, Willem; and van der Sar, Jacob C., 4,943,670, Cl. 585-601.000.
Johnson, Thomas H., 4,943,396, Cl. 260-405.500.
Johnson, Thomas H., 4,943,397, Cl. 260-405.500.
Nathoo, Nazim S., 4,943,222, Cl. 425-89.000.
Wong, Pui-Kwan, 4,943,665, Cl. 568-633.000.

Shelnut, James G.: *See*—
Lipson, Melvin A.; Carter, Thomas P.; Shelnut, James G.; and Roos, Leo, 4,943,513, Cl. 430-260.000.

Sheltoe, Vernon E. Fail-safe coolant thermostat system for an internal combustion engine. 4,942,849, Cl. 123-41.100.

Shepherd, Donald: *See*—
Schaltenbrand, Robert W.; Seman, Brian; and Shepherd, Donald, 4,943,890, Cl. 361-388.000.

Shibata, Hiroki; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, to Koito Manufacturing Co., Ltd. Automotive illumination system. 4,943,893, Cl. 362-37.000.

Shibata, Keiichiro: *See*—
Hamamoto, Masaya; and Shibata, Keiichiro, 4,943,102, Cl. 296-96.210.

Shibata, Toshihiko: *See*—
Kanamura, Tomotsugu; Shibata, Toshihiko; and Inoue, Yasuji, 4,943,477, Cl. 428-286.000.

Shibuya, Masato: *See*—
Mori, Susumu; and Shibuya, Masato, 4,943,733, Cl. 250-548.000.

Shigematsu, Takashi: *See*—
Watanabe, Tomoyuki; Tokoro, Setsuo; Hayashi, Takashi; and Shigematsu, Takashi, 4,942,950, Cl. 192-0.096.

Shigeta, Kunio: *See*—
Takahashi, Jiro; Tsuzita, Kenzi; Takagiwa, Hiroyuki; Shigeta, Kunio; and Masaki, Hiroya, 4,943,507, Cl. 430-120.000.

Shiiki, Kazuo: *See*—
Takano, Hisashi; Hamakawa, Yoshihiro; Shiiki, Kazuo; Otomo, Shigekazu; and Kumasaka, Noriyuki, 4,943,879, Cl. 360-126.000.

Shiina, Toshio: *See*—
Takada, Hiromi; Suzuki, Takami; Shiina, Toshio; Okamoto, Keiji; Komurasaki, Takeshi; Yoshioka, Satoru; Sakuma, Nobuo; and Matsuura, Tadashi, 4,943,128, Cl. 350-6.900.

Shima, Kenji: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,943,916, Cl. 364-200.000.

Shimada, Hiroyuki: *See*—
Aoki, Takashi; Terayama, Satoshi; Iwaki, Yoshihisa; Sekine, Noboru; Shimada, Hiroyuki; Takemasa, Nobuo; and Miyake, Junichi, 4,942,787, Cl. 74-867.000.

Shimizu Construction Co., Ltd.: *See*—
Kumagai, Takenori, 4,942,698, Cl. 52-6.000.

Shimizu, Hideo: *See*—
Sugiura, Masato; Shimizu, Hideo; Imamura, Shigeru; and Sugiura, Fumitoshi, 4,943,380, Cl. 252-8.700.

Shimizu, Keizo: *See*—
Okamoto, Kaizo; Ichihara, Akira; Sato, Akimune; Hirata, Kenji; Hirayama, Katsuhisa; Hina, Eiji; Nakaji, Shigeru; Sakamoto, Minoru; Tanaka, Takashi; and Shimizu, Keizo, 4,942,773, Cl. 73-864.450.

Shimizu, Masahisa: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,943,916, Cl. 364-200.000.

Shimizu, Mitsuo; Maehara, Kazuo; Shinohara, Hidenobu; and Kojima, Hideo, to Sanden Corporation. Control device for heat pump with hot-water supply facility. 4,943,003, Cl. 237-2.00B.

Shimizu, Wataru: *See*—
Yoshinaga, Yoshio; Shimizu, Wataru; and Obara, Toshio, 4,943,868, Cl. 358-403.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Arai, Masatoshi; Fujioka, Kazutoshi; and Satou, Masaharu, 4,943,613, Cl. 524-773.000.
Gomyo, Shiro; and Kobori, Takahide, 4,943,620, Cl. 525-474.000.
Itagaki, Akinari; Yamaya, Masaaki; Yoshioka, Hiroshi; Watanabe, Akihiko; and Miyazato, Keita, 4,943,452, Cl. 427-299.000.

Shinada, Keiko: *See*—
Hirose, Tadashi; Nakao, Kazuo; and Shinada, Keiko, 4,943,968, Cl. 371-19.000.

Shinko Pantec Company, Limited: *See*—
Sugisawa, Masanori; Sasaki, Takashi; and Nishimoto, Yoshihito, 4,943,360, Cl. 204-182.300.

Shinoda, Takashi; and Sakai, Osamu, to Hitachi, Ltd. Semiconductor memory with an improved dummy cell arrangement and with a built-in error correction code circuit. 4,943,967, Cl. 371-2.200.

Shinohara, Hidenobu: *See*—
Shimizu, Mitsuo; Maehara, Kazuo; Shinohara, Hidenobu; and Kojima, Hideo, 4,943,003, Cl. 237-2.00B.

Shinohara Machinery Co., Ltd.: *See*—
Sugiyama, Osamu, 4,942,814, Cl. 101-232.000.

Shiomi, Toshio: *See*—
Hosoda, Makoto; and Shiomi, Toshio, 4,943,934, Cl. 364-518.000.

Shiota, Tsuneo; and Takeuchi, Soji, to Chuo Electronics Co., Ltd. Video surveillance system for selectively selecting processing and displaying the outputs of a plurality of TV cameras. 4,943,854, Cl. 358-108.000.

Shiozawa, Shinichi, to Yugen Kaisha Chubuseimitsu. Motor with cup-shaped rotor having cylindrical portions of different diameter. 4,943,748, Cl. 310-67.00R.

Shipko, Frederick J.: *See*—
Goode, Louis; and Shipko, Frederick J., 4,943,289, Cl. 606-1.000.

Shippy, David J.: *See*—
Pechanek, Gerald G.; Shippy, David J.; Snedaker, Mark C.; and Woodward, Sandra S., 4,943,984, Cl. 375-109.000.
Shirai, Hiroshi; Tatsumi, Takashi; Kanda, Hisashi; Fukuo, Koichi; Motsumoto, Masahiko; and Hiro, Toshiaki, to Honda Giken Kogyo Kabushiki Kaisha. Valve operating device for use in internal combustion engine. 4,942,854, Cl. 123-90.170.
Shirakawa, Shingo: *See*—
Yamazaki, Takeo; Ogihara, Satoru; Kosugi, Tetsuo; Shirakawa, Shingo; and Owada, Shinichi, 4,943,795, Cl. 338-21.000.
Shireman, Mark J.; and Benson, Florence G., to Honeywell Inc. Automated lead wire tinning apparatus mechanical adjustments and improvements. 4,942,843, Cl. 118-74.000.
Shirley S. Lan: *See*—
Hsu, Pi-Chen, 4,942,964, Cl. 206-334.000.
Shirling, David J., to AMP Incorporated. Pin grid array having seperate posts and socket contacts. 4,943,846, Cl. 357-80.000.
Shiromizu, Hisaharu; Morikawa, Asao; Sukegawa, Tsuneyuki; and Kondo, Kazuo, to NGK Spark Plug Co., Ltd. Ceramic substrate for electrical devices. 4,943,470, Cl. 428-209.000.
Shishido, Osamu; Noguchi, Satoru; and Seino, Seiji, to Amano Corporation. Bulky dust sweeper. 4,942,639, Cl. 15-83.000.
Shkornik, Alexander: *See*—
Boroduliu, German; Shkornik, Alexander; Persidsky, Maxim D.; and Narayan, Perinchery, 4,942,869, Cl. 128-43.000.
Shriver, Frank L.; and Schultz, Robert H., to Adolph Coors Company. Container transfer system. 4,942,955, Cl. 198-471.100.
Shrock, Paul: *See*—
Baker, Richard W.; and Shrock, Paul, 4,943,475, Cl. 428-246.000.
Shtarkman, Emil M., to TRW Inc. Rotary shock absorber with a controlled damping rate. 4,942,947, Cl. 188-267.000.
Shuji, Inoue, to Kureha Rubber Industry Co., Ltd. Printing plates for corrugated board. 4,943,467, Cl. 428-159.000.
Sibold, Josie. Plant supporting umbrella. 4,942,693, Cl. 47-44.000.
Siefer, David A.; and Purcell, Alexander M., to Summagraphics Corporation. Backlit digitizer tablet. 4,943,689, Cl. 178-18.000.
Siegenthaler, Peter; and Zwahlen, Andreas, to Seewer AG. Apparatus for coating sheets of dough with fat. 4,942,842, Cl. 118-24.000.
Siehling, Mark B.: *See*—
Van Antwerp, Stanley R.; and Siehling, Mark B., 4,943,904, Cl. 363-144.000.
Siemens Aktiengesellschaft: *See*—
Gerlach, Hans-Juergen; and Aichinger, Horst, 4,943,988, Cl. 378-108.000.
Krueger, Hans; and Welsch, Wolfgang, 4,943,972, Cl. 372-107.000.
Mattelin, Antoon, 4,943,346, Cl. 156-651.000.
Schoenwald, Siegfried, 4,943,208, Cl. 415-175.000.
Siewert, Robert L.: *See*—
Erickson, Warren R.; and Siewert, Robert L., 4,942,826, Cl. 105-178.000.
Simazaki, Toshikatsu: *See*—
Hayashi, Fusashi; Takei, Kooichi; Matii, Yooichi; Simazaki, Toshikatsu; Imai, Akihito; and Nakada, Takao, 4,943,542, Cl. 501-12.000.
Simmons, Elsie A. Cooking jacket. 4,942,809, Cl. 99-426.000.
Simmons, Kelvin A.: *See*—
Davis, Anton; Simmons, Kelvin A.; and Blair, Richard, 4,942,885, Cl. 128-842.000.
Simmons, Marion I.; and Geyer, Harry J., to Motorola, Inc. Data device module having locking groove. 4,943,708, Cl. 235-492.000.
Simmons, Pat, to Centron Corporation. Threaded pin and box construction for composite tubulars. 4,943,094, Cl. 285-333.000.
Simon Fraser University: *See*—
Hardy, R. H. Stephen; and Radziejewski, Ian R., 4,944,038, Cl. 370-85.500.
Simoncelli, Philippe, to Ferco International Usine de Ferrures de Batiment. Fittings for doors, windows or the like. 4,942,694, Cl. 49-192.000.
Simonoff, Adam J., to United States of America, Navy. Chemical agent monitor and control interface. 4,943,929, Cl. 364-496.000.
Sims, Clinton N. Astigmatic self-refractor and method of use. 4,943,162, Cl. 351-235.000.
Sims, Richard M.: *See*—
Langley, Marshall E., Jr.; Sims, Robert C.; Sims, Richard M.; and Turek, James N., 4,942,714, Cl. 52-687.000.
Sims, Robert C.: *See*—
Langley, Marshall E., Jr.; Sims, Robert C.; Sims, Richard M.; and Turek, James N., 4,942,714, Cl. 52-687.000.
Sinay, Pierre: *See*—
Jacquinet, Jean-Claude; Petitou, Maurice; Sinay, Pierre; and Choay, Jean, 4,943,630, Cl. 536-123.000.
Sinkunas, Peter J.; Ritter, Rodney L.; and Altpeter, James E., to Ford Motor Company. Solder flow well for reflowing solder of multipin components. 4,942,997, Cl. 228-56.100.
Sircar, Jagadish C.: *See*—
Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; and Sircar, Jagadish C., 4,943,587, Cl. 514-415.000.
Sitter, Alfred: *See*—
Bernd, Hubert; Heiby, Pierre; and Sitter, Alfred, 4,943,212, Cl. 417-7.000.
Skibo, Michael D.: *See*—
Bruski, Richard S.; Hudson, Larry G.; and Skibo, Michael D., 4,943,490, Cl. 428-614.000.
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; and Campbell, Ian B., to Glaxo Group Limited. Dichloroaniline derivatives. 4,943,591, Cl. 514-539.000.
Skiles, Bruce L.: *See*—
Page, Mary J.; Hamilton, Benton W.; Skiles, Bruce L.; and Reinhart, Robert V., Jr., 4,943,282, Cl. 604-198.000.
Skrbina, John R.; Polityka, Gregory A.; and Smith, Mark L., to Ford Motor Company; and Magna International, Inc. Automotive door assembly having a plug-in electrified interior panel. 4,943,109, Cl. 296-146.000.
SKW Trostberg Aktiengesellschaft: *See*—
Lischka, Helmut; Gmohling, Werner; and Hieber, Gerd, 4,943,317, Cl. 75-312.000.
Slaughter, Grimes G. Non-reflecting transmission line termination. 4,943,739, Cl. 307-443.000.
Slovak, Petr, to Ceske vysoke uceni technicke v Praze. Method for non-invasive electric diagnosis and therapy in hemodialysis and general medicine. 4,942,880, Cl. 128-734.000.
Slusser, J. Michael, to Production Diagnostics, Inc. Valve assembly for showers. 4,942,896, Cl. 137-360.000.
Smirnov, Ary A.: *See*—
Saveliev, Viktor S.; Yablokov, Evgeny G.; Prokubovsky, Vladimir I.; Kolody, Stepan M.; Saveliev, Sergei V.; and Smirnov, Ary A., 4,943,297, Cl. 606-200.000.
Smit, Cornelius J.: *See*—
Mitschker, Alfred; Lange, Peter M.; Hoffmann, Heiko; Lossmann, Gunter; van der Meer, Andries P.; and Smit, Cornelius J., 4,943,420, Cl. 423-112.000.
Smit Transformation B.V.: *See*—
Bose, Ajit K., 4,943,887, Cl. 361-56.000.
Smith, Gaylord D.: *See*—
Benn, Raymond C.; Smith, Gaylord D.; and Boone, Donald H., 4,943,487, Cl. 418-552.000.
Smith, Harry C., Jr. Dunk tank seat release mechanism. 4,943,064, Cl. 273-384.000.
Smith, Jon D., to Dry Dock Industries, Inc. Axial immobile fastener-receiving member. 4,943,253, Cl. 411-342.000.
Smith, Mark L.: *See*—
Skrbina, John R.; Polityka, Gregory A.; and Smith, Mark L., 4,943,109, Cl. 296-146.000.
Smith, Robert S. One leg exerciser. 4,943,050, Cl. 272-70.000.
Smith, Roger R. Differential with lock-out mechanism. 4,943,269, Cl. 475-231.000.
Smith, Roy E., to UTDC Inc. Flexible shaft coupling having flexible elements interspersed between alternating attachment wedges. 4,943,261, Cl. 464-76.000.
Smith, Stephen H. Post-operative knee rehabilitative dynamometer. 4,943,053, Cl. 272-135.000.
Smits, Guido F.: *See*—
Grunbauer, Henri J. M.; Thoen, Johan A.; and Smits, Guido F., 4,943,597, Cl. 521-167.000.
Smrt, Thomas J., to Fox Valley Systems, Inc. Chassis assembly for spraying apparatus. 4,943,008, Cl. 239-754.000.
SMS Concast, Inc.: *See*—
Poran, Michael; Langner, Carl; and Hury, Shlomo, 4,942,919, Cl. 164-420.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Patzelt, Ulrich, 4,942,754, Cl. 72-247.000.
Snedaker, Mark C.: *See*—
Pechanek, Gerald G.; Shippy, David J.; Snedaker, Mark C.; and Woodward, Sandra S., 4,943,984, Cl. 375-109.000.
Snelgrove, R. Vernon: *See*—
McCullough, Francis P., Jr.; and Snelgrove, R. Vernon, 4,943,478, Cl. 428-288.000.
Snyder, George K.: *See*—
Wright, William D.; and Snyder, George K., 4,942,654, Cl. 29-890.035.
Snyder Laboratories, Inc.: *See*—
Markle, Richard A.; Brusky, Phyllis L.; and Baker, John H., 4,943,460, Cl. 428-36.900.
Snyder, Robert F.; and Ferguson, John H., to Raymond Engineering Inc. Torque tool. 4,942,794, Cl. 81-57.220.
So.Re.Ma. Operatrici Ferroviarie Snc di Cesare Rossanigo & C.: *See*—
Rossanigo, Cesare, 4,942,821, Cl. 104-12.000.
Sobel, Johannes: *See*—
Helling, Gunter; Sobel, Johannes; and Langen, Hans, 4,943,519, Cl. 430-512.000.
Societe Anonyme dite: Alcatel CIT: *See*—
Gherardi, Bernard, 4,943,985, Cl. 375-111.000.
Surie, Serge, 4,943,789, Cl. 333-18.000.
Societe Anonyme dite: Alsthom: *See*—
Cros, Michel, 4,942,824, Cl. 105-4.300.
S.A. Srebort: *See*—
Srebot, Robert; and Berthoud, Bernard, 4,943,071, Cl. 279-43.000.
Societe Civile de Recherche D.B.B.: *See*—
Baziard, Yves; Brun, Robert; and Duprat, Annette P., 4,943,453, Cl. 427-309.000.
Societe de Prospection et d'Inventions Techniques (S.P.I.T.): *See*—
Lafforgue, Jean-Jacques; and Schwartz, Claude, 4,943,192, Cl. 408-226.000.
Societe d'Etudes, Recherches et Constructions Electroniques - Sercel: *See*—
Rabian, Jean; Potet, Jean-Claude; and Buchon, Michel, 4,943,955, Cl. 368-156.000.
Societe Nationale d'Etude et de Construction de Moteurs d-Aviation (SNECMA): *See*—
Kapala, Patrick; and Mareix, Jean-Pierre, 4,943,013, Cl. 244-54.000.
Societe Nationale Elf Aquitaine (Production): *See*—
Arretz, Emmanuel, 4,943,662, Cl. 568-66.000.

Sohlbrand, Heinrich. Procedure and equipment for the thermal treatment of semiconductor materials. 4,943,234, Cl. 432-152.000.

Sokaris, Jerry G., to Albany International Corp. Water removal on papermachine through riblet effect. 4,943,476, Cl. 428-280.000.

Soltis, Richard E.; Logothetis, Eleftherios M.; and Aslam, Mohammad, to Ford Motor Company. Preparation of superconducting oxide films using a pre-oxygen nitrogen anneal. 4,943,558, Cl. 505-1.000.

Soltninasab, Sohrab: *See*—
Hargest, Thomas S.; Soltninasab, Sohrab; and Novack, Robert C., 4,942,635, Cl. 5-453.000.

Soma, Takao: *See*—
Oda, Isao; Soma, Takao; Tsuno, Nobuo; Ando, Takashi; and Nakasuji, Yoshizumi, 4,942,999, Cl. 228-124.000.

Sommen, Francois M.: *See*—
Janssens, Frans E.; Diels, Gaston S. M.; Torremans, Joseph L. G.; and Sommen, Francois M., 4,943,580, Cl. 514-303.000.

Sony Corporation: *See*—
Asaida, Takashi, 4,943,850, Cl. 358-55.000.
Oishi, Shigeru; Abe, Takao; Nagaura, Toru; and Watanabe, Mochiyuki, 4,943,497, Cl. 429-53.000.

Soria, Claudine: *See*—
Jolles, Pierre; Fiat, Anne-Marie; Soria, Claudine; Levy-Toledano Sylviane; Raha, Sanghamitra; Mazoyer, Elisabeth; and Drouet, Ludovic, 4,943,562, Cl. 514-18.000.

Soto, Toby A.: *See*—
Jacobs, Paul T.; Berry, Ronald F.; and Soto, Toby A., 4,943,414, Cl. 422-28.000.

Space Industries Partnership, L.P.: *See*—
Ferree, Herbert E.; and Revelj, Ellen J., 4,942,793, Cl. 81-54.000.

Spalding & Evenflo Companies, Inc.: *See*—
Meeker, Paul K., 4,943,113, Cl. 297-250.000.

Sparacio, Frank J.: *See*—
Emma, Philip G.; Knight, Joshua W., III; Pomerene, James H.; Rechtschaffen, Rudolph N.; and Sparacio, Frank J., 4,943,908, Cl. 364-200.000.

Sparkomatic Corporation: *See*—
Straka, Michael J., 4,943,085, Cl. 280-770.000.

Sparks, Bradley A., to RCA Licensing Corporation. Memory retention system for volatile memory devices. 4,943,961, Cl. 365-228.000.

Spectra-Physics, Inc.: *See*—
Fiet, Zeev; Kostyk, Douglas; and Woods, Robert J., 4,943,971, Cl. 372-46.000.
McRight, William C., 4,943,127, Cl. 350-6.800.

Spectramed, Inc.: *See*—
Koch, Mark; and Murray, Richard C., Jr., 4,943,364, Cl. 204-415.000.

Speer, J. Alexander, to KDI Electro-Tec Corporation. Multi-channel, off-axis, bi-directional fiber optic slipring. 4,943,137, Cl. 350-96.180.

Spencer, Earl W., Jr.: *See*—
Leavell, David R.; Spencer, Earl W., Jr.; and Bacon, Bruce L., 4,943,951, Cl. 367-111.000.

Spencer, Steven R., to Tapour, Inc. Container closure with spigot valve. 4,942,976, Cl. 220-254.000.

Sperry, David A.: *See*—
Mondragon, Carl W.; and Sperry, David A., 4,943,148, Cl. 350-529.000.

Spinelli, Larry J., to Benjamin Obdyke Incorporated. Venting of roofs. 4,942,699, Cl. 52-57.000.

Spiragaine S.A.: *See*—
Chefson, Patrice, 4,942,953, Cl. 193-25.00C.

Sporer, Alfred H., to International Business Machines Corporation. High quality thermal jet printer configuration suitable for producing color images. 4,943,816, Cl. 346-25.000.

SPS Technologies, Inc.: *See*—
Dahl, Warren, 4,943,196, Cl. 411-361.000.

Srebot, Robert; and Berthoud, Bernard, to S.A. Srebort. Collet adaptable to a machine-tool fitted with a chuck. 4,943,071, Cl. 279-43.000.

Srivastava, Pramod K.: *See*—
Field, Lamar; Musallam, Hikmat A.; Macke, Jeffrey D.; and Srivastava, Pramod K., 4,943,657, Cl. 562-125.000.

Srivastava, Vishnu C.; and Wollan, John J., to General Electric Company. Superconducting switch pack. 4,943,792, Cl. 335-216.000.

SSI Medical Services, Inc.: *See*—
Hargest, Thomas S.; Soltninasab, Sohrab; and Novack, Robert C., 4,942,635, Cl. 5-453.000.

SSMC Inc.: *See*—
Kitai, Koji, 4,942,834, Cl. 112-199.000.

Stack Holding Inc.: *See*—
Stackhouse, Mildred K., 4,942,987, Cl. 223-37.000.

Stackhouse, Mildred K., to Stack Holding Inc. Method of folding sterile surgical garments before and after sterilization. 4,942,987, Cl. 223-37.000.

Stadelhofer, Jurgen: *See*—
Boenigk, Winfried; Zander, Maximilian; and Stadelhofer, Jurgen, 4,943,365, Cl. 208-44.000.

Stadlmann, Gunter, to Optyl Eyewear Fashion International Corporation. Ski goggles with heated lens. 4,942,629, Cl. 2-435.000.

Staefa Control Systems, Inc.: *See*—
Haessig, David L.; Hamidi, Jamshid; and Hort, Roger V., 4,942,921, Cl. 165-16.000.

Stanford University: *See*—
Zdeblick, Mark, 4,943,032, Cl. 251-11.000.

Stanley, Lonnie D.: *See*—
Link, Donald J.; and Stanley, Lonnie D., 4,942,689, Cl. 43-42.240.

Staples, Paul R., to E. M. B. Corporation. Diaphragm type switch. 4,943,696, Cl. 200-407.000.

Starrfraumaschinen AG: *See*—
Hillen, Gerhard, 4,943,199, Cl. 414-331.000.

Stavrianopoulos, Jannis G., to Enzo Biochem, Inc. Detectable molecules, method of preparation and use. 4,943,523, Cl. 435-7.000.

STC PLC: *See*—
Greenwood, John C.; and Naden, James M., 4,942,766, Cl. 73-704.000.

Steckel, Mark G.: *See*—
Sahatjian, Ronald A.; Ribbins, Robert C., III; and Steckel, Mark G., 4,943,473, Cl. 428-245.000.

Steele, James R., to Dynamic Air Inc. Blender for pneumatically mixing batches of dry granular materials by tumbling. 4,943,163, Cl. 366-106.000.

Steffenhagen, Ulrich, to VDO Adolf Schindling AG. Device for temporarily blocking the re-measurement of an electric oil level measurement of a machine, particularly an internal combustion engine. 4,943,797, Cl. 340-450.300.

Steffens, John C.: *See*—
Mutschler, Martha A.; and Steffens, John C., 4,943,563, Cl. 514-23.000.

Steiger, Wolfgang: *See*—
Guzman-Edery, Jorge; Steiger, Wolfgang; and Boer, Michael, 4,943,926, Cl. 364-486.000.

Steinmetz, Mark G.: *See*—
Van Antwerp, William P.; Steinmetz, Mark G.; and Goudy, Paul R., Jr., 4,943,357, Cl. 204-157.150.

Stella, Michel G., to Texas Instruments Incorporated. Method for synthesizing echo effect from digital speech data. 4,944,014, Cl. 381-51.000.

Stemp, Geoffrey: *See*—
Evans, John M.; Stemp, Geoffrey; Burrell, Gordon; and Cassidy, Frederick, 4,943,582, Cl. 514-320.000.

Stempfel, Sonja: *See*—
Oetliker, Hans; Winiger, Peter; and Stempfel, Sonja, 4,943,159, Cl. 356-73.000.

Stephen, James C.: *See*—
Alden, J. Michael; Schlosser, Erich J.; and Stephen, James C., 4,942,862, Cl. 126-337.00R.

Stephens, Ronald R.; Craig, Richard R.; Yen, Huan W.; and Lind, Richard C., to Hughes Aircraft Company. Four-pass phase conjugate optical amplifier system and method. 4,943,782, Cl. 330-4.300.

Sterenberg, Lawrence D. Ski boot holder. 4,942,994, Cl. 224-247.000.

Stern, Joseph A.; Green, Stephen L.; King, Charles B.; and May, Sharon B., to Medev Corporation. Needlestick protective glove. 4,942,626, Cl. 2-161.00R.

Stevens, Robert E.: *See*—
Norman, John A. T.; and Stevens, Robert E., 4,943,673, Cl. 585-845.000.

Stewart, John F.; and Richardson, Russell D., to Cooper Industries, Inc. Ergonomic handle for hand-held tools. 4,942,791, Cl. 81-177.100.

Steyr-Daimler-Puch AG: *See*—
Kriebernegg, August; and Lanzer, Heribert, 4,942,951, Cl. 192-58.00C.

Stinehelfizer, Jonathan J.: *See*—
Guo, Tzen-Wen; and Stinehelfizer, Jonathan J., 4,943,737, Cl. 307-296.700.

Stobie, James A.: *See*—
Norton, Peter W.; Stobie, James A.; and Zimmermann, Peter H., 4,943,491, Cl. 428-620.000.

Stone, Robert J.: *See*—
Campbell, W. Carroll; Evans, Michael W.; Browning, Edward A., Jr.; and Stone, Robert J., 4,943,762, Cl. 323-284.000.

Stoner, Eugene M., to ARES, Inc. Convertible, belt/clip-fed automatic gun with positive shell casing ejection. 4,942,802, Cl. 89-191.010.

Stoy, George P.: *See*—
Stoy, Vladimir A.; Stoy, George P.; and Lovy, Jan, 4,943,618, Cl. 525-340.000.

Stoy, Vladimir A.; Stoy, George P.; and Lovy, Jan, to Kingston Technologies Limited Partnership. Method for preparing polyacrylonitrile copolymers by heterogeneous reaction of polyacrylonitrile aquagel. 4,943,618, Cl. 525-340.000.

Straka, Michael J., to Sparkomatic Corporation. Side bar assembly for vehicles such as pick-up trucks, off-road vehicles and the like. 4,943,085, Cl. 280-770.000.

Strauss, Hans: *See*—
Bankel, Adolf; Strauss, Hans; and Kerk, Stephan, 4,942,816, Cl. 102-235.000.

Stricharczuk, Paul T.: *See*—
Janda, Dennis J.; Stricharczuk, Paul T.; and Minchak, Robert J., 4,943,621, Cl. 526-127.000.

Stricker, Saul, to Abiomed Limited Partnership. Insertable balloon with curved support. 4,943,275, Cl. 600-18.000.

Strobel, Wolfgang: *See*—
Wagner, Wolf-Dietrich; Klumpp, Rolf; Strobel, Wolfgang; and Brenker, Gunter, 4,942,858, Cl. 123-193.00H.

Strutz, Gerd: *See*—
Schroder, Franz; and Strutz, Gerd, 4,943,335, Cl. 156-244.180.

Stucki, Felix, to Girsberger Holding AG. Swivel chair with adjustable back rest. 4,943,115, Cl. 297-301.000.

Stuhldreher, Terrence M., to Uniroyal Goodrich Tire Company, The. Curable rubber bladder stocks having reduced viscosity. 4,943,609, Cl. 524-314.000.

Stults, Jeffrey S.; and Schwartz, Willis T., to Occidental Chemical Corporation. Halo-oxydiphthalic anhydrides. 4,943,642, Cl. 549-241.000.

Su, Sophia R.; and Fitzpatrick, Leo F., to GTE Laboratories Incorporated. Method of making high purity dense silica of large particle size. 4,943,425, Cl. 423-338.000.
Sucrow, Wolfgang; Wolter, Herbert; and Eidenschink, Rudolf, to Merck Patent Gesellschaft mit beschrankter Haftung. Cyclohexane derivatives. 4,943,384, Cl. 252-299.610.
Sudol, Marion A.: *See*—
Buckholz, Lawrence L., Jr.; Byrne, Brian; and Sudol, Marion A., 4,943,697, Cl. 219-10.55B.
Suetaka, Hiroyuki; and Kurahashi, Shigeki, to Casio Computer Co., Ltd. Electronic still camera. 4,943,867, Cl. 358-342.000.
Sugawara, Saburo: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; Sugawara, Saburo; Nakamura, Susao; Matsuo, Hirofumi; Nomura, Katsuhiko; Nishio, Etsuro; and Ishii, Haruo, 4,944,030, Cl. 354-403.000.
Sugden, Kenneth B., to Sundstrand Corporation. Mechanical differential. 4,943,267, Cl. 475-6.000.
Sugi, Masahito: *See*—
Yazaki, Yoshio; and Sugi, Masahito, 4,943,427, Cl. 424-1.100.
Sugimoto, Masaki; Morikawa, Kunihiko; Hisomi, Nobuteru; Ikeura, Kenji; Kitahara, Hisashi; Hirano, Hiroyuki; and Takatori, Kazuhiro, to Nissan Motor Co., Ltd. Magnetostriction type torque sensor. 4,942,771, Cl. 73-862.360.
Sugimura, Nobuyuki. Stepped thread and cutoff thread joint exhibiting excellent fatigue resistance. 4,943,095, Cl. 285-334.000.
Sugisawa, Masanori; Sasaki, Takashi; and Nishimoto, Yoshihito, to Shinko Pantec Company, Limited. Process for recovering nitric acid and hydrofluoric acid from waste pickle liquors. 4,943,360, Cl. 204-182.300.
Sugishima, Kiyohisa, to Canon Kabushiki Kaisha. Image magnify/-reduce apparatus. 4,943,870, Cl. 358-451.000.
Sugita, Naomasa; Yotumoto, Yoshiharu; Moriguchi, Kouji; and Sekiba, Toshinobu, to Kabushiki Kaisha Toshiba. Semiconductor device with fuse function. 4,943,842, Cl. 357-51.000.
Sugiura, Fumitoshi: *See*—
Sugiura, Masato; Shimizu, Hideo; Imamura, Shigeru; and Sugiura, Fumitoshi, 4,943,380, Cl. 252-8.700.
Sugiura, Masato; Shimizu, Hideo; Imamura, Shigeru; and Sugiura, Fumitoshi, to Takemoto Yushi Kabushiki Kaisha. Antistatic resin composition with transparency containing phosphonium sulphonate. 4,943,380, Cl. 252-8.700.
Sugiyama, Osamu, to Shinohara Machinery Co., Ltd. Operation stand for measuring sheet size for sheet-fed press. 4,942,814, Cl. 101-232.000.
Sugiyama, Takeyoshi: *See*—
Bowers, William S.; and Sugiyama, Takeyoshi, 4,943,586, Cl. 514-406.000.
Sukegawa, Tsuneyuki: *See*—
Shiromizu, Hisaharu; Morikawa, Asao; Sukegawa, Tsuneyuki; and Kondo, Kazuo, 4,943,470, Cl. 428-209.000.
Sulenski, Timothy J., to Xerox Corporation. Developer dispensing apparatus with a spring element hold down shoe mechanism. 4,943,830, Cl. 355-245.000.
Sumitomo Chemical Company, Limited: *See*—
Inoue, Masakazu; Asai, Kuniaki; Hieda, Kazuo; and Kobayashi, Tadayasu, 4,943,606, Cl. 523-457.000.
Sumitomo Electric Industries, Ltd.: *See*—
Tanaka, Hirohisa, 4,943,922, Cl. 364-426.020.
Sumitomo Heavy Industries, Ltd.: *See*—
Hiraoka, Eiichi; Akagi, Toshio; Yano, Kiyotaka; and Onaka, Junji, 4,942,972, Cl. 220-3.000.
Sumitomo Pharmaceuticals Co., Ltd.: *See*—
Sunagawa, Makoto, 4,943,569, Cl. 514-210.000.
Sumiya, Koji: *See*—
Moroto, Shuzo; Sumiya, Koji; Yokoyama, Shouji; Nimura, Mitsuhiro; and Nanba, Akimasa, 4,943,925, Cl. 364-449.000.
Summagraphics Corporation: *See*—
Siefer, David A.; and Purcell, Alexander M., 4,943,689, Cl. 178-18.000.
Sumner & Taylor, Inc.: *See*—
Raahauge, Jerald C., 4,943,817, Cl. 346-140.00A.
Sunagawa, Makoto, to Sumitomo Pharmaceuticals Co., Ltd. B-lactam compounds. 4,943,569, Cl. 514-210.000.
Sundqvist, Hans, to Valmet Paper Machinery, Inc. Apparatus and method for regulating the profile of a paper web passing over a Yankee cylinder in an integrated IR-dryer/Yankee hood. 4,942,675, Cl. 34-23.000.
Sundstrand Corporation: *See*—
Hosford, Gregory S., 4,942,733, Cl. 60-267.000.
Shekleton, Jack R., 4,943,230, Cl. 431-183.000.
Sugden, Kenneth B., 4,943,267, Cl. 475-6.000.
Sung, Chien-Min; Chen, Sy-Hwa; Merrill, Leo; and Bigelow, Louis K., to Norton Company. Low pressure bonding of PCD bodies and method for drill bits and the like. 4,943,488, Cl. 428-552.000.
Sunstar Giken Kabushiki Kaisha: *See*—
Okuri, Yasuhiro; and Sakakibara, Toshimori, 4,943,604, Cl. 523-428.000.
Sunstar Kabushiki Kaisha: *See*—
Awamura, Masaki; Yamamoto, Kazushi; and Nanjo, Masashi, 4,943,431, Cl. 424-70.000.
Surie, Serge, to Societe Anonyme dite: Alcatel CIT. Automatic equalizer for digital transmission. 4,943,789, Cl. 333-18.000.
Sutcliffe Group Limited: *See*—
Beltzig, Gunter, 4,943,046, Cl. 272-1.00R.
Suter, Richard R.: *See*—
Gehring, Mark R.; Suter, Richard R.; and Ragan, Lawrence H., 4,944,025, Cl. 455-207.000.
Sutton, Richard C.: *See*—
Reithel, Raymond F.; and Sutton, Richard C., 4,943,514, Cl. 430-270.000.
Suzuki, Akira: *See*—
Mushika, Sadahiko; and Suzuki, Akira, 4,942,735, Cl. 60-416.000.
Suzuki, Hideo, to Yamaha Corporation. Method of generating a tone signal. 4,942,799, Cl. 84-603.000.
Suzuki, Koji: *See*—
Sakai, Jun; Higashiyama, Shunichi; Suzuki, Koji; and Obta, Mitsuru, 4,943,509, Cl. 430-138.000.
Suzuki, Masato; and Mizutani, Tomio, to Toko Kabushiki Kaisha. Molded coil and manufacturing method thereof. 4,943,794, Cl. 336-192.000.
Suzuki, Morio: *See*—
Kamayachi, Yuichi; Sawazaki, Kenji; Suzuki, Morio; and Inagaki, Shoji, 4,943,516, Cl. 430-280.000.
Nitoh, Hirohisa; Ohura, Otami; and Suzuki, Morio, 4,943,661, Cl. 564-26.000.
Suzuki, Satosi: *See*—
Takeda, Kenji; Kamiya, Sigeru; Suzuki, Satosi; and Yoshino, Yasuhisa, 4,943,123, Cl. 303-111.000.
Suzuki, Sunao, to Mitsubishi Denki Kabushiki Kaisha. Electric quantity detecting method. 4,943,766, Cl. 324-132.000.
Suzuki, Takami: *See*—
Takada, Hiromi; Suzuki, Takami; Shiina, Toshio; Okamoto, Keiji; Komurasaki, Takeshi; Yoshioka, Satoru; Sakuma, Nobuo; and Matsuura, Tadashi, 4,943,128, Cl. 350-6.900.
Suzuki, Takaya: *See*—
Konishi, Nobutake; Ono, Kikuo; Suzuki, Takaya; and Miyata, Kenji, 4,943,837, Cl. 357-23.700.
Suzuki, Tatsuo: *See*—
Takahashi, Ken; Kabe, Kazuyuki; and Suzuki, Tatsuo, 4,942,914, Cl. 152-531.000.
Suzuki, Yoshiki: *See*—
Nakano, Masahiro; Fukushima, Shoji; Kawaguchi, Takeo; and Suzuki, Yoshiki, 4,943,564, Cl. 514-50.000.
Swapp, Mavin C., to Motorola, Inc. Digital time base generator with adjustable delay between two outputs. 4,943,787, Cl. 331-2.000.
Swedal-Systems HB: *See*—
Bergquist, Dan, 4,942,711, Cl. 52-397.000.
Symons, Robert W., to PN International Corp. Amusement device propelled by an eccentric apparatus. 4,943,256, Cl. 446-278.000.
Syntex (U.S.A.) Inc.: *See*—
Crews, Phillip; Matthews, Thomas R.; and Horton, Paul, 4,943,589, Cl. 514-468.000.
Szego, Andras: *See*—
Detre, Tamas; Angyan, Sandor; Pap, Laszlo; Szego, Andras; Karadi, Zoltan; Bertus nee Bende, Klara; and Marmarosi nee Kellner, Katalin, 4,943,307, Cl. 71-3.000.
Szente, Pedro A.; and Riley, Russell B., to Hewlett-Packard Company. Wide dynamic range radio-frequency power sensor. 4,943,764, Cl. 324-95.000.
Szu, Harold H., to United States of America, Navy. Superconducting neural network computer and sensor array. 4,943,556, Cl. 505-1.000.
Szuster, Paul A. P. Computer carry basket. 4,943,029, Cl. 248-917.000.
Tachi, Hiroshi: *See*—
Okinaga, Takayuki; Tachi, Hiroshi; Ozaki, Hiroshi; Otsuka, Kanji; Furukawa, Michiaki; and Yamasaki, Yasuyuki, 4,943,843, Cl. 357-70.000.
Tachi, Shinichi; Tsujimoto, Kazunori; Okudaira, Sadayuki; and Mukai, Kiichiro, to Hitachi, Ltd. Etching method. 4,943,344, Cl. 156-643.000.
Tack, Carl E., Jr., to TransDyne, Inc. Bottom rod safety guard for railway brake rigging. 4,942,946, Cl. 188-210.000.
Taeger, Tilman: *See*—
Christner, Juergen; Pfleiderer, Ernst; Taeger, Tilman; and Bernschein, Ursula, 4,943,530, Cl. 435-188.000.
Tahoe Products Incorporated: *See*—
Wilder, Richard L., 4,943,712, Cl. 250-221.000.
Taiyo Ink Manufacturing Co., Ltd.: *See*—
Kamayachi, Yuichi; Sawazaki, Kenji; Suzuki, Morio; and Inagaki, Shoji, 4,943,516, Cl. 430-280.000.
Tajima, Ikuo; and Hasegawa, Hidec, to Tokai Kogyo Mishin Kabushiki Kaisha. Data setting device for an embroidering machine. 4,943,906, Cl. 364-188.000.
Tajima, Keiichi: *See*—
Shibata, Hiroki; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, 4,943,893, Cl. 362-37.000.
Takada, Hiromi; Suzuki, Takami; Shiina, Toshio; Okamoto, Keiji; Komurasaki, Takeshi; Yoshioka, Satoru; Sakuma, Nobuo; and Matsuura, Tadashi, to Ricoh Company, Ltd. Light scanning device. 4,943,128, Cl. 350-6.900.
Takagiwa, Hiroyuki: *See*—
Takahashi, Jiro; Tsuzita, Kenzi; Takagiwa, Hiroyuki; Shigeta, Kunio; and Masaki, Hiroya, 4,943,507, Cl. 430-120.000.
Takahashi, Jiro; Tsuzita, Kenzi; Takagiwa, Hiroyuki; Shigeta, Kunio; and Masaki, Hiroya, to Konishiroku Photo Instruy Co., Ltd. Toner for developing electrostatic latent image and method for developing electrostatic latent image with the same. 4,943,507, Cl. 430-120.000.
Takahashi, Kazuki: *See*—
Shibata, Hiroki; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, 4,943,893, Cl. 362-37.000.

Takahashi, Ken; Kabe, Kazuyuki; and Suzuki, Tatsuo, to Yokohama Rubber Co., Ltd., The. Heavy duty and medium pneumatic radial tire. 4,942,914, Cl. 152-531.000.

Takahashi, Kenji: *See*—
Arakawa, Satoshi; Takahashi, Kenji; and Hosoi, Yuichi, 4,944,026, Cl. 250-484.100.

Takahashi, Kinya: *See*—
Nozawa, Yusaku; Yuasa, Kazumasa; Ootu, Wataru; and Takahashi, Kinya, 4,942,900, Cl. 137-490.000.

Takahashi, Kiyohiko: *See*—
Watanabe, Masao; Mizoguchi, Shuri; Kawai, Satoshi; Takahashi, Kiyohiko; and Tanimura, Toyokiti, 4,943,206, Cl. 414-786.000.

Takahashi, Mizunori; Ikeda, Tsuyoshi; and Yamaguchi, Yoshiharu, to Dic-Hercules Chemicals, Inc. Rosin emulsion sizing agent. 4,943,608, Cl. 524-272.000.

Takahashi, Nagashige; and Ouchi, Teruo, to Asahi Kogaku Kogyo K.K. Distal end part of endoscope. 4,942,867, Cl. 128-6.000.

Takahashi, Takeshi, to Toyota Jidosha Kabushiki Kaisha. Actuator for a fuel injector. 4,943,004, Cl. 239-95.000.

Takahashi, Yoshito: *See*—
Aishima, Shizuo; Takahashi, Yoshito; Kosemura, Masaki; and Ohkawara, Masaaki, 4,943,449, Cl. 427-213.300.

Takai, Hitoshi: *See*—
Kageyama, Sadashi; Abe, Yoshio; Yasumoto, Yoshio; Inoue, Shuji; Takai, Hitoshi; Matsumoto, Mitsujiro; Aono, Kouji; Uchimura, Kiyoshi; and Eiji, Iwasaki, 4,944,032, Cl. 358-12.000.

Takano, Hisashi; Hamakawa, Yoshihiro; Shiiki, Kazuo; Otomo, Shigekazu; and Kumasaka, Noriyuki, to Hitachi, Ltd. Thin film magnetic head including magnetic layers having high saturation magnetic flux density and metal film for avoiding deterioration during manufacturing. 4,943,879, Cl. 360-126.000.

Takasago, Hayato: *See*—
Niki, Kenichi; Kokogawa, Tohru; Ishizu, Akira; and Takasago, Hayato, 4,943,768, Cl. 324-158.00F.

Takase, Shigeki: *See*—
Ito, Katsuo; Hibino, Eiichi; Nishimura, Masahiro; Kinoshita, Kazunori; and Takase, Shigeki, 4,943,810, Cl. 343-702.000.

Takashi, Rinichi: *See*—
Miyamoto, Hiroseori; Kondo, Hidefumi; Haga, Hirohide; and Takashi, Rinichi, 4,943,933, Cl. 364-513.000.

Takata Corporation: *See*—
Kitamura, Hideo; and Nakagawa, Ichiro, 4,943,011, Cl. 242-107.000.
Nakayama, Yoshikazu, 4,943,027, Cl. 248-548.000.

Takatori, Kazuhiro: *See*—
Sugimoto, Masaki; Morikawa, Kunihiko; Hitomi, Nobuteru; Ikeura, Kenji; Kitahara, Hisashi; Hirano, Hiroyuki; and Takatori, Kazuhiro, 4,942,771, Cl. 73-862.360.

Takeda Chemical Industries, Ltd.: *See*—
Okada, Taiiti; and Ishida, Toru, 4,943,666, Cl. 568-709.000.
Terao, Shinji; Okazaki, Hisayoshi; and Imada, Isuke, 4,943,645, Cl. 552-309.000.

Takeda, Hidekazu; Nagai, Kyuichirou; Ogiro, Kenji; Aman, Mitsuji; and Takita, Kouhei, to Hitachi, Ltd. Tape tension controller for a cassette recording/playback apparatus. 4,943,874, Cl. 360-85.000.

Takeda, Kenji; Kamiya, Sigeru; Suzuki, Satosi; and Yoshino, Yasuhisa, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Brake control apparatus in diagonal braking hydraulic pressure supply system for use in motor vehicles. 4,943,123, Cl. 303-111.000.

Takeda, Shigeru; and Tsuboi, Takashi, to Hitachi Metals, Ltd. Resonance absorption-type microstrip line isolator. 4,943,790, Cl. 333-24.200.

Takeda, Tadashi; Ueno, Noboru; and Miyazaki, Yasumitsu, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Tapered optical waveguide, waveguide type optical head using same and optical waveguide. 4,943,129, Cl. 350-96.120.

Takehara, Sadao; Fujisawa, Toru; Arai, Yoshi; and Kurokawa, Jitsuo, to Dainippon Ink & Chemicals, Inc.; and Kawamura Institute of Chemical Research. Liquid crystalline compounds having substituents. 4,943,386, Cl. 252-299.650.

Takei, Kooichi: *See*—
Hayashi, Fusashi; Takei, Kooichi; Matii, Yooichi; Simazaki, Toshikatsu; Imai, Akihito; and Nakada, Takao, 4,943,542, Cl. 501-12.000.

Takeishi, Kazuvasu: *See*—
Yarita, Takao; Moro, Yutaka; Takeishi, Kazuvasu; and Ohashi, Shinichi, 4,943,927, Cl. 364-470.000.

Takemae, Eiji; Koizumi, Masakazu; and Ishibashi, Tadashi, to Yokohama Rubber Co., Ltd., The; and Chiyoda Kenki Co., Ltd. Composite hose construction. 4,942,905, Cl. 138-118.000.

Takemasa, Nobuo: *See*—
Aoki, Takashi; Terayama, Satoshi; Iwaki, Yoshihisa; Sekine, Noboru; Shimada, Hiroyuki; Takemasa, Nobuo; and Miyake, Junichi, 4,942,787, Cl. 74-867.000.

Takemoto Yushi Kabushiki Kaisha: *See*—
Sugiura, Masato; Shimizu, Hideo; Imamura, Shigeru; and Sugiura, Fumitoshi, 4,943,380, Cl. 252-8.700.

Takemura, Hitoshi; Gotoh, Nobuo; and Isobe, Moriyuki, to JEOL Ltd. Charged particle beam lithography method. 4,943,730, Cl. 250-492.300.

Takeshita, Naoko: *See*—
Sakura, Kathuhiko; Takeuchi, Genki; and Takeshita, Naoko, 4,943,553, Cl. 585-471.000.

Takeuchi, Genki: *See*—
Sakura, Kathuhiko; Takeuchi, Genki; and Takeshita, Naoko, 4,943,553, Cl. 585-471.000.

Takeuchi, Masato: *See*—
Okada, Hideo; Mori, Toshikatsu; Mitsugi, Kouichi; Iwase, Yoshio; Kuroe, Satoshi; Takeuchi, Masato; and Kamo, Tomoichi, 4,943,496, Cl. 429-45.000.

Takeuchi, Soji: *See*—
Shiota, Tsuneo; and Takeuchi, Soji, 4,943,854, Cl. 358-108.000.

Takeuchi, Yoshimitsu: *See*—
Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; and Mitsudo, Makoto, 4,943,541, Cl. 501-10.000.

Taki, Kazunari, to Brother Kogyo Kabushiki Kaisha. Thin-film optical function element, and optical head using the same. 4,943,131, Cl. 350-96.120.

Takita, Kouhei: *See*—
Takeda, Hidekazu; Nagai, Kyuichirou; Ogiro, Kenji; Aman, Mitsuji; and Takita, Kouhei, 4,943,874, Cl. 360-85.000.

Talmadge, Karen D.: *See*—
Protter, Andrew A.; Vigne, Jean-Louis; Mallory, Joanne B.; Talmadge, Karen D.; and Kane, John P., 4,943,527, Cl. 435-69.600.

Tamano, Akimasa: *See*—
Ikeda, Masami; Yamada, Yasuhiro; Tuji, Mahito; Tamano, Akimasa; and Mizoguchi, Yasunari, 4,943,800, Cl. 340-567.000.

Tanaka, Hirohisa, to Sumitomo Electric Industries, Ltd. Antilock control assembly. 4,943,922, Cl. 364-426.020.

Tanaka, Koichi: *See*—
Aoki, Takayoshi; Ishii, Yukihiro; Tanaka, Koichi; and Sadamatsu, Shigeru, 4,943,505, Cl. 430-109.000.

Tanaka, Kojiro: *See*—
Hayashi, Yutaka; Kojima, Yoshikazu; Kamiya, Masaaki; and Tanaka, Kojiro, 4,943,943, Cl. 365-185.000.

Tanaka, Shigemori: *See*—
Toma, Hitoshi; Hisamura, Masafumi; and Tanaka, Shigemori, 4,943,819, Cl. 346-160.100.

Tanaka, Sumio: *See*—
Imamiya, Keniti; Tanaka, Sumio; Miyamoto, Junichi; Atsumi, Shigeru; Ohtsuka, Nobuaki; and Saito, Shinji, 4,943,962, Cl. 365-230.080.

Tanaka, Takashi: *See*—
Okamoto, Kaizo; Ichihara, Akira; Sato, Akimune; Hirata, Kenji; Hirayama, Katsuhisa; Hina, Eiji; Nakaji, Shigeru; Sakamoto, Minoru; Tanaka, Takashi; and Shimizu, Keizo, 4,942,773, Cl. 73-864.450.

Tanaka, Toshihide: *See*—
Okada, Tatsunori; Miyazaki, Masayuki; Tanaka, Toshihide; Hatoh, Chiaki; and Mukai, Masahiro, 4,943,495, Cl. 429-35.000.

Tanaka, Toshiichiro: *See*—
Hayashi, Nobuhiro; Tanaka, Toshiichiro; Yamaguchi, Seiji; and Imai, Hidetoshi, 4,942,640, Cl. 15-319.000.

Tanaka, Toshio: *See*—
Hidaka, Hiroyoshi; Tanaka, Toshio; Itoh, Yasuo; Kato, Hideo; Koshinaka, Eiichi; Mitani, Kazuya; and Sakurai, Shunichiro, 4,943,581, Cl. 514-307.000.

Tanese, Naoko: *See*—
Goff, Stephen P.; Tanese, Naoko; and Roth, Monica J., 4,943,531, Cl. 435-194.000.

Tanguy, Christian, to Zimmer S.A. Drilling feeler, in particular for positioning and securing a medullary nail. 4,943,291, Cl. 606-64.000.

Taniguchi, Haruyuki: *See*—
Kijima, Takao; Edahiro, Takeshi; Koyama, Toshihide; and Taniguchi, Haruyuki, 4,943,082, Cl. 280-673.000.

Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Photographic camera. 4,943,825, Cl. 354-481.000.

Tanimura, Toyokiti: *See*—
Watanabe, Masao; Mizoguchi, Shuri; Kawai, Satoshi; Takahashi, Kiyohiko; and Tanimura, Toyokiti, 4,943,206, Cl. 414-786.000.

Tanisake, Hiroka; Okumura, Hiroyuki; Namikawa, Akira; Ishikawa, Masato; and Abe, Toshiaki, to Mitsubishi Gas Chemical Company, Inc. Fiber-reinforced unsaturated polyester. 4,943,607, Cl. 523-500.000.

Tank, Eggert, to Daimler-Benz AG. Process for producing an aluminum/magnesium alloy. 4,943,413, Cl. 420-528.000.

Tapour, Inc.: *See*—
Spencer, Steven R., 4,942,976, Cl. 220-254.000.

Tarragona, Margarita V.: *See*—
Palou, Antonio S.; and Tarragona, Margarita V., 4,943,054, Cl. 273-1.00R.

Tatsumi, Akira, to Hitachi Construction Machinery Co., Ltd. Drive control system for hydraulic construction machine. 4,942,737, Cl. 60-431.000.

Tatsumi, Takashi: *See*—
Shirai, Hiroshi; Tatsumi, Takashi; Kanda, Hisashi; Fukuo, Koichi; Motsumoto, Masahiko; and Hiro, Toshiaki, 4,942,854, Cl. 123-90.170.

Taub, Alan I.; Lee, Minyoung; and Hibbs, Louis E., Jr., to General Electric Company. Apparatus for shear-cutting a stack of amorphous steel sheets. 4,942,798, Cl. 83-636.000.

Taubitz, Christof; Gausepohl, Hermann; Seiler, Erhard; Boehlke, Klaus; and Schlemmer, Lothar, to BASF Aktiengesellschaft. Continuous preparation of molding materials based on polyphenylene ethers and nylons. 4,943,399, Cl. 264-101.000.

Taylor, Reginald M., to Hallsworth & Associates Pty. Limited. Relating to the formation of metal alkoxides and metal powders by the use of microwave radiation. 4,943,316, Cl. 75-0.50A.

Tech Zeal Industrial C., Ltd.: *See*—
Hwang, Feng-Lin, 4,942,806, Cl. 98-2.020.

Technovision Cameras Limited: *See*—
Mester, Gyula, 4,943,019, Cl. 248-123.100.
Teck, Yap Y.; Wah, Lim T.; Geok, Anna T. K.; and Weng, Chan H., to Molex Incorporated. Grounding electrical connector. 4,943,244, Cl. 439-567.000.
Teijin Limited: *See*—
Nakano, Masahiro; Fukushima, Shoji; Kawaguchi, Takeo; and Suzuki, Yoshiki, 4,943,564, Cl. 514-50.000.
Teknion Furniture Systems Inc.: *See*—
Hellwig, John; and Bradbury, Philip, 4,942,805, Cl. 98-1.000.
Tektronix, Inc.: *See*—
Van Horne, Arthur C.; Hoffman, Eldon P.; and Bakke, Paul D., 4,943,045, Cl. 271-277.000.
Tel Sagami Limited: *See*—
Nakao, Ken; Sato, Seishiro; and Ohkase, Wataru, 4,943,235, Cl. 432-205.000.
Tel, Teunis, to Seculock B. V. Device for the protected storage of objects. 4,942,831, Cl. 109-29.000.
Telectronics, N.V.: *See*—
Gotthardt, Gerhard R., 4,942,876, Cl. 128-419.00P.
Tencza, Thomas M.; and Kim, Chung-Bin, to Bristol-Myers Squibb Company. Analgesic tablet of aspirin and caffeine containing low-substituted hydroxypropyl cellulose. 4,943,565, Cl. 514-161.000.
Terada, Hiroaki: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,943,916, Cl. 364-200.000.
Terada, Takao; and Kobayashi, Toshiyuki, to Omron Tateisi Electronics Co. Steam inhaler. 4,942,874, Cl. 128-203.160.
Teramoto, Kazuyoshi: *See*—
Uesaka, Kazuo; Yamada, Akira; Teramoto, Kazuyoshi; Nishiyama, Ituo; and Haraga, Kousuke, 4,943,862, Cl. 358-245.000.
Terao, Naoyoshi: *See*—
Ichikawa, Souji; Oka, Hideki; Terao, Naoyoshi; and Sakagami, Seiji, 4,943,716, Cl. 250-231.160.
Terao, Shinji; Okazaki, Hisayoshi; and Imada, Isuke, to Takeda Chemical Industries, Ltd. Benzoquinone derivatives and production thereof. 4,943,645, Cl. 552-309.000.
Terasaka, Katsunori, to Nissan Motor Co., Ltd. Air-fuel ratio control system for automotive internal combustion engine or the like with fuel type discrimination capabilities. 4,942,848, Cl. 123-1.00A.
Terashima, Kanetsugu: *See*—
Furukawa, Kenji; and Terashima, Kanetsugu, 4,943,387, Cl. 252-299.670.
Terayama, Kazuyoshi, to NEC Corporation. Semiconductor memory circuit with improved bit lane precharge circuit. 4,943,952, Cl. 365-207.000.
Terayama, Satoshi: *See*—
Aoki, Takashi; Terayama, Satoshi; Iwaki, Yoshihisa; Sekine, Noboru; Shimada, Hiroyuki; Takemasa, Nobuo; and Miyake, Junichi, 4,942,787, Cl. 74-867.000.
Terlouw, Willem: *See*—
Goodall, Brian L.; Terlouw, Willem; and van der Sar, Jacob C., 4,943,670, Cl. 585-601.000.
Terrell, David R.; Monbaliu, Marcel J.; Grigo, Ulrich; and Berg, Klaus, to Agfa-Gevaert, N.V. Photosensitive recording material suited for use in electrophotography containing dihydroquinoline charge transport compounds. 4,943,502, Cl. 430-58.000.
Terumo Kabushiki Kaisha: *See*—
Onishi, Makoto; Seita, Yukio; and Koyama, Noriyuki, 4,943,373, Cl. 210-500.420.
Tesch, Norbert: *See*—
Thomson, Kenneth L.; Fenton, Hank; and Tesch, Norbert, 4,943,035, Cl. 256-64.000.
Texas A & M University System, The: *See*—
McFarland, Andrew R., 4,942,774, Cl. 73-864.810.
Texas Instruments Incorporated: *See*—
Davis, Cecil J.; and Matthews, Robert, 4,943,457, Cl. 428-35.200.
Gordon, Robert J.; Love, Brian J.; Peterson, Robert K.; and Ozmat, Burhan, 4,943,468, Cl. 428-210.000.
Havemann, Robert H., 4,943,536, Cl. 437-28.000.
Stella, Michel G., 4,944,014, Cl. 381-51.000.
Zogas, Peter, 4,943,844, Cl. 357-74.000.
Themig, Daniel J., to Dresser Industries, Inc. Liner isolation and well completion system. 4,942,925, Cl. 166-382.000.
Themont, Jean-Pierre: *See*—
Dannoux, Thierry L.; Laroulandie, Pierre J.; and Themont, Jean-Pierre, 4,943,130, Cl. 350-96.120.
Theobald, Hans; Kuenast, Christoph; Hofmeister, Peter; Neubauer, Hans-Juergen; Kuekenhoehner, Thomas; Krieg, Wolfgang; Leyendecker, Joachim; and Kardorff, Uwe, to BASF Aktiengesellschaft. (p-Phenoxyphenoxy)-methyl-five-membered hetaryls. 4,943,584, Cl. 514-380.000.
Therma-Tron-X, Inc.: *See*—
Acker, John N.; and Andreae, Bradley M., 4,942,956, Cl. 198-465.300.
Thiel, Reinhard: *See*—
Immel, Otto; Schwarz, Hans-Helmut; and Thiel, Reinhard, 4,943,549, Cl. 502-304.000.
Thoen, Johan A.: *See*—
Grunbauer, Henri J. M.; Thoen, Johan A.; and Smits, Guido F., 4,943,597, Cl. 521-167.000.
Thoese, Klaus; and Jung, Karl-Heinz, to Hoechst Aktiengesellschaft. Polyester film. 4,943,510, Cl. 430-160.000.
Thoma, Klaus; Lindstadt, Klaus; and Rudolf, Karl. Hollow charge. 4,942,819, Cl. 102-476.000.
Thomas, Henry A.; and McBride, Larry J. Adjustable bed. 4,942,633, Cl. 5-11.000.
Thomas, Mit. Apparatus for trotline fishing. 4,942,688, Cl. 43-27.200.
Thommes, James M., to PowCon Inc. System for supplying power. 4,943,699, Cl. 219-121.570.
Thompson, Peter B. Roof covering. 4,942,712, Cl. 52-506.000.
Thompson, Philip W.; and Wood, Lesley A., to Celltech Limited. Anti-lift fermenter. 4,943,535, Cl. 435-311.000.
Thomson-CSF: *See*—
Delacourt, Dominique; Papuchon, Michel; and Pocholle, Jean Paul, 4,943,144, Cl. 350-354.000.
Vieux, Garard; Diaz, Francis; and de Groot, Paul, 4,943,254, Cl. 445-28.000.
Thomson, Kenneth L.; Fenton, Hank; and Tesch, Norbert, to Amplas, Inc. Barricade. 4,943,035, Cl. 256-64.000.
Thong, John T. L.: *See*—
Breton, Bernard C.; Thong, John T. L.; and Nixon, William C., 4,943,722, Cl. 250-310.000.
Thorn EMI plc: *See*—
Lang, Anthony; and Bloch, Paul, deceased, 4,943,126, Cl. 350-3.690.
Thornton, Nelson E. Strip lug and nut remover. 4,942,792, Cl. 81-53.200.
Thornton, William E., Jr.; and Whitmore, Henry B., to United States of America, National Aeronautics and Space Administration. Method for waste collection and storage. 4,942,632, Cl. 4-661.000.
Thyssen Nordseewerke GmbH: *See*—
Hellmann, Jens-Holger; Holscher, Richard; Janssen, Hermann J.; Kleemann, Alfred; Rupp, Karl-Heinz; Schwarz, Joachim; Varges, Gunter; and Waas, Heinrich, 4,942,837, Cl. 114-40.000.
Timet: *See*—
Bania, Paul J.; and Parris, Warren M., 4,943,412, Cl. 420-420.000.
Timmons, John W. External incontinency device. 4,942,886, Cl. 128-885.000.
Todd, Philip A.; and Walker, Bobby R. Piezoelectric incandescent lamp test device. 4,943,752, Cl. 310-339.000.
Todd, Thomas W.: *See*—
Fankhauser, John H., II; and Todd, Thomas W., 4,942,642, Cl. 17-46.000.
Todd, Wayne A.; and Ryan, Hunter D., Jr. Housing structure. 4,942,706, Cl. 52-234.000.
Todo, Akira; Kimura, Toshio; Minoda, Takeshi; and Kurisu, Masayoshi, to Mitsui Petrochemical Industries, Ltd. Resin composition for spacers of information recording disc. 4,943,611, Cl. 524-493.000.
Tofte, Semor D.: *See*—
Hiniker, Thomas K.; and Tofte, Semor D., 4,942,765, Cl. 73-431.000.
Tokai Denka Kogyo Kabushiki Kaisha: *See*—
Nitoh, Hirohisa; Ohura, Osami; and Suzuki, Morio, 4,943,661, Cl. 564-26.000.
Tokai Kogyo Mishin Kabushiki Kaisha: *See*—
Tajima, Ikuo; and Hasegawa, Hidec, 4,943,906, Cl. 364-188.000.
Tokai Rubber Industries, Ltd.: *See*—
Igarashi, Ichiro; and Nishimura, Kazuhiko, 4,942,906, Cl. 138-126.000.
Toko Kabushiki Kaisha: *See*—
Suzuki, Masato; and Mizutani, Tomio, 4,943,794, Cl. 336-192.000.
Tokoro, Setsuo: *See*—
Watanabe, Tomoyuki; Tokoro, Setsuo; Hayashi, Takashi; and Shigematsu, Takashi, 4,942,950, Cl. 192-0.096.
Tokyo Electron Limited: *See*—
Yokota, Keiichi, 4,943,767, Cl. 324-158.00F.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Yamamoto, Fumiaki; Otsuka, Tsutomu; and Funo, Yasuo, 4,943,408, Cl. 376-210.000.
Toma, Hitoshi; Hisamura, Masafumi; and Tanaka, Shigemori, to Canon Kabushiki Kaisha. Image holding member and image forming device. 4,943,819, Cl. 346-160.100.
Tomikashi, Minoru: *See*—
Kanegae, Hidetoshi; Tomikashi, Minoru; Hino, Akira; and Ueno, Takashi, 4,943,924, Cl. 364-431.120.
Tomura, Shinya; and Yasuda, Sachiko, to Kabushiki Kaisha Toshiba. Method for developing an electrostatic latent image. 4,943,504, Cl. 430-102.000.
Tooley, Patricia A.: *See*—
Kolts, John H.; Brown, Scott H.; and Tooley, Patricia A., 4,943,550, Cl. 502-327.000.
Torigoe, Takeshi: *See*—
Kuhara, Akio; Yoshitake, Akira; Torigoe, Takeshi; and Amako, Shinji, 4,943,489, Cl. 428-586.000.
Toro Company, The: *See*—
Mylne, John M., III, 4,943,917, Cl. 364-420.000.
Torremans, Joseph L. G.: *See*—
Janssens, Frans E.; Diels, Gaston S. M.; Torremans, Joseph L. G.; and Sommen, Francois M., 4,943,580, Cl. 514-303.000.
Tosaka, Yasuo: *See*—
Yoshizawa, Tomomi; Ogi, Keiji; Tosaka, Yasuo; Kuramoto, Kazuya; and Nonaka, Yoshiyuki, 4,943,518, Cl. 430-378.000.
Toshiba Monofrax Co., Ltd.: *See*—
Endo, Shigeo; Kawashima, Haruo; Hirata, Kimio; Saito, Yasuo; Uchiya, Takao; and Yanagi, Hideo, 4,943,398, Cl. 264-82.000.
Toshiyasu, Masayuki; Chihara, Kazuhiro; and Iwasaki, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Magnetic shielding with constant-current coils for CRT. 4,943,755, Cl. 315-8.000.

Touchstone Applied Science Associates, Inc.: *See*—
Koslin, Betram L., 4,943,239, Cl. 434-353.000.
Toyo Ink Manufacturing Co., Ltd.: *See*—
Sato, Takeshi; Miyazaki, Shuji; Sakamoto, Makoto; and Ando, Motonori, 4,943,681, Cl. 430-495.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Chujo, Yoshiki; Inoue, Tokuta; Konomi, Toshiaki; and Hyodo, Yoshihiko, 4,942,860, Cl. 123-571.000.
Haraguchi, Tetsunori, 4,943,092, Cl. 280-660.000.
Takahashi, Takeshi, 4,943,004, Cl. 239-95.000.
Watanabe, Tomoyuki; Tokoro, Setsuo; Hayashi, Takashi; and Shigematsu, Takashi, 4,942,950, Cl. 192-0.096.
Zyogahara, Masakazu; Yokoyama, Shinichi; and Yamanaka, Hisashi, 4,943,263, Cl. 464-180.000.
Trackmobile, Inc.: *See*—
Erickson, Warren R.; and Siewert, Robert L., 4,942,826, Cl. 105-178.000.
TransDyne, Inc.: *See*—
Tack, Carl E., Jr., 4,942,946, Cl. 188-210.000.
Trauth, Hubert: *See*—
Aumueller, Alexander; Neumann, Peter; and Trauth, Hubert, 4,943,391, Cl. 252-401.000.
Travers, Christine; and Franck, Jean-Pierre, to Institut Francais du Petrole. Normal paraffin isomerization catalyst comprising a mordenite and titanium. 4,943,546, Cl. 502-66.000.
Trevisan, Sandra. Eyebrow-cover element. 4,942,891, Cl. 132-216.000.
Trialsite Limited: *See*—
Breton, Bernard C.; Thong, John T. L.; and Nixon, William C., 4,943,722, Cl. 250-310.000.
Tripke, Randall K. Safety trailer step. 4,943,076, Cl. 280-166.000.
Troster, Manfred: *See*—
Hofmann, Heinrich; and Troster, Manfred, 4,943,171, Cl. 384-537.000.
Trottier, Allan J. Hair highlighting capsule. 4,942,893, Cl. 132-270.000.
Truhler, Janet E.: *See*—
Sauber, Charles J.; and Truhler, Janet E., 4,942,959, Cl. 206-5.100.
Truszkowska, Krystyna: *See*—
Lounsberry, Brian D.; and Truszkowska, Krystyna, 4,943,989, Cl. 378-130.000.
TRW Inc.: *See*—
Allen, Reginald A., 4,943,931, Cl. 364-513.000.
Harwood, Oliver P.; and Love, John A., 4,943,014, Cl. 244-158.00R.
Rabe, William T.; and Gilbert, Wendell L., 4,942,803, Cl. 91-370.000.
Shtarkman, Emil M., 4,942,947, Cl. 188-267.000.
Tseng, Jeou N. Socket and bulb snap fastener for christmas light strings. 4,943,899, Cl. 362-226.000.
Tsinberg, Mikhail: *See*—
Bakhmutsky, Michael; Cavallerano, Alan P.; Tsinberg, Mikhail; and Basile, Carlo, 4,943,856, Cl. 358-141.000.
Tsuboi, Takashi: *See*—
Takeda, Shigeru; and Tsuboi, Takashi, 4,943,790, Cl. 333-24.200.
Tsuchiya, Sohji; Kudoh, Yasuo; Kojima, Toshikuni; Fukuyama, Masao; and Yoshimura, Susumu, to Matsushita Electric Industrial Co., Ltd. Solid electrolytic capacitor and method for manufacturing the same. 4,943,892, Cl. 361-525.000.
Tsujimoto, Kazunori: *See*—
Tachi, Shinichi; Tsujimoto, Kazunori; Okudaira, Sadayuki; and Mukai, Kiichiro, 4,943,344, Cl. 156-643.000.
Tsukane, Nagayoshi: *See*—
Sato, Masaru; and Tsukane, Nagayoshi, 4,943,957, Cl. 428-694.000.
Tsunemi, Hidenari; Fushiki, Yasuo; Nishimura, Asaichi; and Kawai, Yousuke, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Unsaturated polyester resin compositions and electrical laminates made therefrom. 4,943,474, Cl. 428-246.000.
Tsuno, Nobuo: *See*—
Oda, Isao; Soma, Takao; Tsuno, Nobuo; Ando, Takashi; and Nakasuji, Yoshizumi, 4,942,999, Cl. 228-124.000.
Tsurumiya, Osamu, to Honda Giken Kogyo Kabushiki Kaisha. Steering control apparatus for a motor vehicle with steerable front and rear wheels. 4,943,758, Cl. 318-504.000.
Tsushima, Hiroaki: *See*—
Ezawa, Hiroshi; Nakakura, Toshiyuki; Watanabe, Takayuki; and Tsushima, Hiroaki, 4,943,594, Cl. 521-79.000.
Tsutsumi, Yasuhisa: *See*—
Ohwada, Akira; Sakai, Masanori; and Tsutsumi, Yasuhisa, 4,943,116, Cl. 297-362.000.
Tsuzita, Kenzi: *See*—
Takahashi, Jiro; Tsuzita, Kenzi; Takagiwa, Hiroyuki; Shigeta, Kunio; and Masaki, Hiroya, 4,943,507, Cl. 430-120.000.
Tsviatko, Ganev; and Goran, Fallman. Apparatus for reducing pitting in copper water pipes. 4,943,371, Cl. 210-101.000.
Tuji, Mahito: *See*—
Ikeda, Masami; Yamada, Yasuhiro; Tuji, Mahito; Tamano, Akimasa; and Mizoguchi, Yasunari, 4,943,800, Cl. 340-567.000.
Turchan, Otto C. Method of reducing the oxides of nitrogen in fossil fuels combustion and combustion effluents using amine compounds. 4,943,421, Cl. 423-235.000.
Turek, James N.: *See*—
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McGrath, James E.; Yoo, Youngtai; Turner, Robert B.; and Lewis, Diane M., 4,943,626, Cl. 528-408.000.
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Gobert, Jean; Geerts, Jean-Pierre; and Bodson, Guy, 4,943,639, Cl. 548-550.000.
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Uchiya, Takao: *See*—
Endo, Shigeo; Kawashima, Haruo; Hirata, Kimio; Saito, Yasuo; Uchiya, Takao; and Yanagi, Hideo, 4,943,398, Cl. 264-82.000.
Uchiyama, Akira, to Seiko Epson Corporation. Coated article and method of production. 4,943,486, Cl. 428-469.000.
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Maeda, Yasutaka; Miyamoto, Tsuyochi; Ueno, Yukihiko; and Washio, Hiromi, 4,943,834, Cl. 355-327.000.
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Ohtsuka, Hiroshi; and Ueno, Yutaka, 4,943,994, Cl. 379-53.000.
Uesaka, Kazuo; Yamada, Akira; Teramoto, Kazuyoshi; Nishiyama, Ituo; and Haraga, Kousuke, to Mitsubishi Denki Kabushiki Kaisha. Cathode-ray tube with multi-layer resin coating on faceplate providing implosion protection. 4,943,862, Cl. 358-245.000.
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Dombek, Bernard D., 4,943,551, Cl. 502-345.000.
Uniroyal Chemical Company, Inc.: *See*—
Bell, Allyn R., 4,943,309, Cl. 71-74.000.
Lai, Hoi K.; Davis, Robert A.; and Blem, Allen R., 4,943,311, Cl. 71-90.000.
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Stuhldreher, Terrence M., 4,943,609, Cl. 524-314.000.
Unisys Corporation: *See*—
Criswell, Peter B., 4,943,969, Cl. 371-68.100.
United Kingdom Atomic Energy Authority: *See*—
Bowe, Michael J.; and Clark, Stuart A., 4,943,007, Cl. 239-405.000.
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Agriculture: *See*—
Humpherys, Allan S.; and Oest, Elvert E., 4,943,184, Cl. 405-39.000.
Air Force: *See*—
Fuschetto, Anthony N., 4,943,771, Cl. 324-207.180.
Energy: *See*—
Riley, Brian, 4,943,494, Cl. 429-30.000.
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Vishnuvajjala, B. Rao; and Garzon-Aburbeh, Aaron, 4,943,579, Cl. 514-283.000.

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Capron, Mark E.; and Jenkins, James F., 4,942,975, Cl. 220-23.400.
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Simonoff, Adam J., 4,943,929, Cl. 364-496.000.
Szu, Harold H., 4,943,556, Cl. 505-1.000.
U.S. Philips Corp.: *See*—
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Boskamp, Eddy B.; and Mens, Wilhelmus R. M., 4,943,775, Cl. 324-322.000.
Eicher, Helmut M., 4,943,174, Cl. 400-703.000.
Kuijk, Karel E., 4,943,802, Cl. 340-784.000.
Severin, Jan W.; and De With, Gijsbertus, 4,943,559, Cl. 505-1.000.
Van Aller, Gerardus; and Wieldraaijer, Jan, 4,943,711, Cl. 250-213.0VT.
Van Beek, Johann R. G. C. M.; and Frens, Gerrit, 4,943,500, Cl. 429-207.000.
Van Heeswijk, Johannes A. A. M.; and Van Gestel, Henricus M. C., 4,943,897, Cl. 362-223.000.
Weenink, Leon P., 4,943,898, Cl. 362-226.000.
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United States Surgical Corporaiton: *See*—
Lander, Jack R., 4,943,280, Cl. 604-169.000.
U.S. Tool & Die, Inc.: *See*—
Wachter, William J., 4,943,410, Cl. 376-261.000.
Univ. of California, The Regents of the: *See*—
Crews, Phillip; Matthews, Thomas R.; and Horton, Paul, 4,943,589, Cl. 514-468.000.
Universal Photonix, Inc.: *See*—
Pinnow, Douglas A., 4,942,747, Cl. 70-263.000.
University of California, The Regents of the: *See*—
Mendelsohn, John; Kawamoto, Tomoyuki; Sato, Gordon; and Sato, J. Denry, 4,943,533, Cl. 435-240.270.
Pechnik, Alexander; and Matthews, M. Dean, 4,943,320, Cl. 75-235.000.
University of Colorado Foundation, Inc., The: *See*—
Gordon, Stuart G., 4,943,524, Cl. 435-7.000.
University of Connecticut, The: *See*—
Bell, James P.; and Yu, Yunzhao, 4,943,619, Cl. 525-463.000.
University of Florida, The: *See*—
Drago, Russell S.; and Davis, Shannon, 4,943,644, Cl. 549-533.000.
University of Massachusetts Medical Center: *See*—
Fay, Fredric S.; Fogarty, Kevin E.; and Rodgers, Cyril, 4,943,142, Cl. 350-315.000.
University of Minnesota, Regents of the: *See*—
Wigness, Bruce D.; and Rohde, Thomas D., 4,943,560, Cl. 514-11.000.
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Gatsis, John G., 4,943,548, Cl. 502-173.000.
Urabe, Hitoshi: *See*—
Horikawa, Hiroshi; Urabe, Hitoshi; and Yako, Katsutoshi, 4,943,869, Cl. 358-426.000.
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Boroduliu, German; Shkornik, Alexander; Persidsky, Maxim D.; and Narayan, Perinchery, 4,942,869, Cl. 128-43.000.
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Fankhauser, John H., II; and Todd, Thomas W., 4,942,642, Cl. 17-46.000.
Usui, Katsuaki: *See*—
Niimura, Yoshihiro; Kikuta, Ritsuo; and Usui, Katsuaki, 4,943,214, Cl. 418-9.000.
UTDC Inc.: *See*—
Smith, Roy E., 4,943,261, Cl. 464-76.000.
Utsunomiya, Kazuhiro; Ooyama, Nobumi; and Sakaba, Hideo, to Power Reactor and Nuclear Fuel Development Corporation. Anomaly diagnosis system for a nuclear reactor core. 4,943,683, Cl. 376-245.000.
Utz, Roland: *See*—
Glombik, Heiner; Utz, Roland; Lang, Hans-Jochen; Geisen, Karl; and Beyhl, Friedrich E., 4,943,576, Cl. 514-249.000.
Vago, Robert E., to Malmros Holding, Inc. Ultrasonic treatment of animals. 4,942,868, Cl. 128-24.00A.
Valis, Johnnie J., to Gannett Co., Inc. Method of and apparatus for protecting a push button on a newspaper vending machine. 4,943,695, Cl. 200-345.000.
Valmet Paper Machinery Inc.: *See*—
Karlsson, Markku, 4,942,674, Cl. 34-18.000.
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Van Aller, Gerardus; and Wieldraaijer, Jan, to U.S. Philips Corporation. Image intensifier tube with input screen having a profile which satisfies a higher degree polynomial. 4,943,711, Cl. 250-213.0VT.
Van Antwerp, Stanley R.; and Siehling, Mark B., to Conrac Corporation. D.C. power unit assembly including unitized single-phase D.C. power units. 4,943,904, Cl. 363-144.000.
Van Antwerp, William P.; Steinmetz, Mark G.; and Goudy, Paul R., Jr., to Photo Redux Corp. Photodegradation of metal chelate complexes. 4,943,357, Cl. 204-157.150.
Van Beek, Johann R. G. C. M.; and Frens, Gerrit, to U.S. Philips Corporation. Sealed electrochemical cell. 4,943,500, Cl. 429-207.000.
Van den Berg, Johan A.; Van Ooyen, Albert J. J.; and Rietveld, Krijn, to Gist-brocades NV. Kluyveromyces as a host strain. 4,943,529, Cl. 435-172.300.
Vanderbilt University: *See*—
Field, Lamar; Musallam, Hikmat A.; Macke, Jeffrey D.; and Srivastava, Pramod K., 4,943,657, Cl. 562-125.000.
VanderLaan, Kenneth J., to Prince Corporatioe. Container holder for a vehicle. 4,943,111, Cl. 297-194.000.
Vanderlee, David G.: *See*—
Provan, Alexander R.; and Vanderlee, David G., 4,943,207, Cl. 414-797.700.
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Mitschker, Alfred; Lange, Peter M.; Hoffmann, Heiko; Lossmann, Gunter; van der Meer, Andries P.; and Smit, Cornelius J., 4,943,420, Cl. 423-112.000.
van der Sar, Jacob C.: *See*—
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van der Sterren, Martin L.: *See*—
Geraets, Jacques J. M.; Graswinckel, Julius V. C.; and van der Sterren, Martin L., 4,943,831, Cl. 355-290.000.
Vanderwetf, Dennis F., to Minnesota Mining and Manufacturing Company. Off axis fresnel reflector for liquid crystal display. 4,943,156, Cl. 353-66.000.
VanDeusen, Herbert; and Voltz, John A., to W. L. Gore & Assocites, Inc. Ribbon coaxial cable with offset drain wires. 4,943,688, Cl. 174-103.000.
Van de Walle, Richard H.: *See*—
Nagle, Dennis C.; and Van de Walle, Richard H., 4,943,301, Cl. 23-313.00R.
Vandnais, Timothy W.; Ekern, Judy M.; and Hennenfent, Douglas J., to Magnetic Peripherals Inc. Method for manufacturing a magnetic head core with a flux gap having a precisely controlled length. 4,942,658, Cl. 29-603.000.
Van Dyke, Lyle H. Adjustable strap for telephone handset support. 4,944,005, Cl. 379-449.000.
Van Gelder, Josephu L. H.: *See*—
Raeymaekers, Alfons H. M.; Freyne, Eddy J. E.; Van Gelder, Josephu L. H.; and Venet, Marc G., 4,943,574, Cl. 514-338.000.
Van Gestel, Henricus M. C.: *See*—
Van Heeswijk, Johannes A. A. M.; and Van Gestel, Henricus M. C., 4,943,897, Cl. 362-223.000.
Van Heeswijk, Johannes A. A. M.; and Van Gestel, Henricus M. C., to U.S. Philips Corporation. Assembly of a light housing and an electric lamp. 4,943,897, Cl. 362-223.000.
Van Horne, Arthur C.; Hoffman, Eldon P.; and Bakke, Paul D., to Tektronix, Inc. Printer sheet feed system. 4,943,045, Cl. 271-277.000.
Vanmarcke, Luc A.; and Cardon, Walter E., to Hydro Agri Sluiskil B.V. Method of producing fertilizer granules containing urea and ammonium sulphate. 4,943,308, Cl. 71-29.000.
Van Ooyen, Albert J. J.: *See*—
Van den Berg, Johan A.; Van Ooyen, Albert J. J.; and Rietveld, Krijn, 4,943,529, Cl. 435-172.300.
Van Scoyk, Pershing R. Youth stirrup attachment. 4,942,721, Cl. 54-46.000.
Van Weezenbeek, Reijer N. Device for the displacement of sediment under water and process for the use of such a device. 4,943,186, Cl. 405-73.000.
Van Winkle, Denzal W., to Drexel Oilfield Services, Inc. Blowout preventer. 4,943,031, Cl. 251-1.300.
Vapor Technologies Inc.: *See*—
Pinkhasov, Eduard, 4,942,844, Cl. 118-723.000.
Varges, Gunter: *See*—
Hellmann, Jens-Holger; Holscher, Richard; Janssen, Hermann J.; Kleemann, Alfred; Rupp, Karl-Heinz; Schwarz, Joachim; Varges, Gunter; and Waas, Heinrich, 4,942,837, Cl. 114-40.000.
Varghese, Philip: *See*—
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Vartanian, George, to International Fuel Cells Corporation. Fuel cell power plant. 4,943,493, Cl. 429-17.000.
VDO Adolf Schindling AG: *See*—
Steffenhagen, Ulrich, 4,943,797, Cl. 340-450.300.
Venet, Marc G.: *See*—
Raeymaekers, Alfons H. M.; Freyne, Eddy J. E.; Van Gelder, Josephu L. H.; and Venet, Marc G., 4,943,574, Cl. 514-338.000.
Vent-Plant Corporation, Inc.: *See*—
Linkow, Leonard I.; Rinaldi, Anthony W.; and Gambale, Michael, 4,943,236, Cl. 433-165.000.
Veranth, Joseph L.: *See*—
Bose, Amar G.; and Veranth, Joseph L., 4,944,018, Cl. 381-86.000.
Vermont American Corporation: *See*—
Gakhar, Ved P.; Dossett, Richard A.; and McCord, Wilfred M., Jr., 4,942,912, Cl. 144-136.00C.
Verstraeten, Alexander J., to Dutch Drilling B.V. Method of contructing a vertical barrier wall in the ground, as well as apparatus for applying this method. 4,943,189, Cl. 405-267.000.

Vescovini, Pietro. Fluid cutoff device in a fluid line. 4,942,901, Cl. 137-614.060.

VG Instruments Group Limited: *See—*
Haines, Raymond C.; and Turner, Patrick J., 4,943,718, Cl. 250-288.000.

Vickers, Donna M. Combination beach bag/beach recliner. 4,942,948, Cl. 190-8.000.

Victor Company of Japan, Ltd.: *See—*
Ishigaki, Yukinobu, 4,943,976, Cl. 375-1.000.

Vidrine, Warren D., Jr., to Measurex Corporation. Method of obtaining accurate compositional information of multi-layer compositions. 4,943,721, Cl. 250-308.000.

Vieux, Garard; Diaz, Francis; and de Groot, Paul, to Thomson-CSF. Method for the fabrication of an improved X-ray image intensifier tube, and intensifier tube, and intensifier tube obtained thereby. 4,943,254, Cl. 445-28.000.

Vigne, Jean-Louis: *See—*
Protter, Andrew A.; Vigne, Jean-Louis; Mallory, Joanne B.; Talmadge, Karen D.; and Kane, John P., 4,943,527, Cl. 435-69.600.

Vinnikov, Lev. Process for conditioning cotton. 4,943,300, Cl. 19-66.00R.

Vinson, James R.: *See—*
Brandon, Michael D.; Dorris, Robert A.; Garrett, Robert T.; Helton, Roy N.; Roney, Don G.; and Vinson, James R., 4,942,679, Cl. 36-102.000.

Visa International Service Association: *See—*
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Visconti, Peter: *See—*
Meyerhoefer, Carl; Neuwirth, Helmuth; and Visconti, Peter, 4,944,003, Cl. 379-412.000.

Vishnuvajjala, B. Rao; and Garzon-Aburbeh, Aaron, to United States of America, Health and Human Services. Water soluble prodrugs of camptothecin. 4,943,579, Cl. 514-283.000.

Vital Force, Inc.: *See—*
Conaway, Robert M., 4,942,750, Cl. 72-56.000.

Viteq Corporation: *See—*
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Vogel, Klaus: *See—*
Reymann, Wolfgang; Gropp, Heiko-Ulrich; Vogel, Klaus; and Muller, Hartwig, 4,943,228, Cl. 425-526.000.
Reymann, Wolfgang; Gropp, Heiko-Ulrich; Vogel, Klaus; Muller, Hartwig; and Wiedenfeld, Walter, 4,943,229, Cl. 425-535.000.

Voltz, John A.: *See—*
VanDeusen, Herbert; and Voltz, John A., 4,943,688, Cl. 174-103.000.

von Angerer, Erwin, to Schering Aktiengesellschaft. 1-carbamoylalkyl-2-phenylindoles, pharmaceutical compositions and use. 4,943,572, Cl. 514-235.200.

von Braunhut, Harold. Camera for photographing simulated X-ray images. 4,943,822, Cl. 354-219.000.

Vork, William D.; and Larson, James H., to Graco Inc. Cartridge pressure regulator. 4,942,899, Cl. 137-454.500.

Vrijkorte, Marcel J. G., to Ericsson Paging Systems B.V. Paging system with paging receivers controlled depending on location. 4,943,803, Cl. 340-825.490.

W. L. Gore & Assocites, Inc.: *See—*
VanDeusen, Herbert; and Voltz, John A., 4,943,688, Cl. 174-103.000.

W. R. Grace & Co.-Conn.: *See—*
Gartner, Ellis M.; Myers, David F.; and Gaidis, James M., 4,943,323, Cl. 106-808.000.
Wimberger, Richard J.; Wickesberg, Donald L.; and Carman, Richard A., 4,942,676, Cl. 34-51.000.

Waas, Heinrich: *See—*
Hellmann, Jens-Holger; Holscher, Richard; Janssen, Hermann J.; Kleemann, Alfred; Rupp, Karl-Heinz; Schwarz, Joachim; Varges, Gunter; and Waas, Heinrich, 4,942,837, Cl. 114-40.000.

Wachter, William A.: *See—*
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Wachter, William J., to U.S. Tool & Die, Inc. Compaction apparatus for spent nuclear fuel rods. 4,943,410, Cl. 376-261.000.

Wada, Kiyoshi: *See—*
Shibata, Hiroki; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, 4,943,893, Cl. 362-37.000.

Wada, Sumio: *See—*
Ichinomiya, Tsutomu; Kami, Tomohiro; Kitagawa, Fumio; Wada, Sumio; Abe, Hideaki; Ise, Youichi; and Kusunoki, Toshio, 4,942,884, Cl. 128-804.000.

Wada, Toshiaki; and Murata, Akio. Thin-film, perpendicular magnetic recording and reproducing head. 4,943,882, Cl. 360-126.000.

Wada, Yoshiomi. Picture book with a pen containing water-soluble ink. 4,943,088, Cl. 281-39.000.

Waechter, Jerome R.; Patten, James T.; and Kempter, Paul C., to A. C. Nielsen Company. Data collection and transmission system with real time clock. 4,943,963, Cl. 370-94.100.

Wagner, Jurgen: *See—*
Hazebrook, Daniel W.; and Wagner, Jurgen, 4,942,652, Cl. 29-898.067.

Wagner, William J.: *See—*
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Wagner, Wolf-Dietrich; Klumpp, Rolf; Strobel, Wolfgang; and Brenker, Gunter, to Daimler-Benz AG. Cylinder head for air-compressing, self-ignition internal combustion engines. 4,942,858, Cl. 123-193.00H.

Wagnon, Gerald E., to Wagnon Power Jack, Inc. Power jack and method. 4,943,034, Cl. 254-122.000.

Wagnon Power Jack, Inc.: *See—*
Wagnon, Gerald E., 4,943,034, Cl. 254-122.000.

Wah, Lim T.: *See—*
Teck, Yap Y.; Wah, Lim T.; Geok, Anna T. K.; and Weng, Chan H., 4,943,244, Cl. 439-567.000.

Wahlen, Erika; and Hoffmann, Dieter, to Kern & Co. Ltd. Telescope. 4,943,149, Cl. 350-568.000.

Wakumura, Shin-ichi: *See—*
Hatanaka, Yuji; Okamoto, Hiroo; Wakumura, Shin-ichi; Miyake, Ichiro; and Sakamoto, Shunichiro, 4,943,964, Cl. 371-31.000.

Waldrep, William N., to Drilco Industrial, Inc. Drill deck bushing. 4,943,172, Cl. 384-565.000.

Waldron, Michael P. Display panels and connector system therefor. 4,942,709, Cl. 52-285.000.

Waldrop, Joe R., to Phillips Petroleum Company. Process for producing a fiber reinforced thermoplastic article. 4,943,404, Cl. 264-257.000.

Walker, Bobby R.: *See—*
Todd, Philip A.; and Walker, Bobby R., 4,943,752, Cl. 310-339.000.

Wallner, Peter H. Tensioning buckle. 4,942,647, Cl. 24-170.000.

Walter, Jean-Claude: *See—*
Cognasse, Christian; Graham, Peter; Maury, Bernard; and Walter, Jean-Claude, 4,944,017, Cl. 381-79.000.

Walz, Klaus: *See—*
Schulze, Hans; Walz, Klaus; Bartkowiak, Frank; and Jakobs, Karlhans, 4,943,299, Cl. 8-610.000.

Walz, Reinhold; Hildebrandt, Klaus; and Willgerodt, Udo, to Carl Schenck AG. Carrier platform for the transport of motor vehicles. 4,942,828, Cl. 108-55.500.

Wander, Robert G. Hand truck for transporting heavy flat articles. 4,943,073, Cl. 280-47.270.

Wang, Bor J. Pipe wrench. 4,942,790, Cl. 81-133.000.

Wang, David; and Chen, Chyi-Song, to Acer Incorporated. Barrier device for an electrical switch. 4,943,693, Cl. 200-304.000.

Wang Laboratories, Inc.: *See—*
Giunta, Richard F.; Becker, Robert D.; Schwartz, Martin J.; Coyle, Richard W.; and Curcuru, Kevin H., 4,943,966, Cl. 371-11.100.

Wankel GmbH: *See—*
Nuber, Roland, 4,943,217, Cl. 418-270.000.

Ward II, Earl D.: *See—*
Aldrich, Charles S.; Craft, James A.; Harden, James P.; Komplin, Steven R.; Rousey, William S.; Shah, Praful M.; Ward II, Earl D.; Wilzbach, Bernard L.; and King, Terry L., 4,943,815, Cl. 346-108.000.

Wardley, Michael T.: *See—*
Barr, John D.; and Wardley, Michael T., 4,942,933, Cl. 175-329.000.

Warkentin, David J.: *See—*
Haritonidis, Joseph H.; Senturia, Stephen D.; Warkentin, David J.; and Mehregany, Mehran, 4,942,767, Cl. 73-705.000.

Warner, Arnold D. Cup holder. 4,943,025, Cl. 248-318.000.

Warner, John F.: *See—*
Rosen, Jonathan I.; and Warner, John F., 4,943,628, Cl. 530-326.000.

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Cetenko, Wiaczeslaw A.; Connor, David T.; Flynn, Daniel L.; and Sircar, Jagadish C., 4,943,587, Cl. 514-415.000.

Warning, Theodore A.: *See—*
Boze, Ronald A.; and Warning, Theodore A., 4,943,379, Cl. 210-778.000.

Washio, Hiromi: *See—*
Maeda, Yasutaka; Miyamoto, Tsuyochi; Ueno, Yukihiko; and Washio, Hiromi, 4,943,834, Cl. 355-327.000.

Wassell, Stephen R. Solar powered lawnmower. 4,942,723, Cl. 56-10.600.

Watanabe, Akihiko: *See—*
Itagaki, Akinari; Yamaya, Masaaki; Yoshioka, Hiroshi; Watanabe, Akihiko; and Miyazato, Keita, 4,943,452, Cl. 427-299.000.

Watanabe, Akira; Takeuchi, Yoshimitsu; Kihara, Seiji; and Mitsudo, Makoto, to Kyushu Refractories Co., Ltd. Glass ceramics. 4,943,541, Cl. 501-10.000.

Watanabe, Hideyuki: *See—*
Imao, Kaoru; and Watanabe, Hideyuki, 4,944,023, Cl. 382-37.000.

Watanabe, Hiroshi, to Kabushiki Kaisha Kenwood. Low sound region reproducing speaker system. 4,944,019, Cl. 381-90.000.

Watanabe, Ichiro: *See—*
Nakamura, Tetsuji; and Watanabe, Ichiro, 4,943,528, Cl. 435-158.000.

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Oishi, Shigeru; Abe, Takao; Nagaura, Toru; and Watanabe, Mochiyuki, 4,943,497, Cl. 429-53.000.

Watanabe, Takayuki: *See—*
Ezawa, Hiroshi; Nakakura, Toshiyuki; Watanabe, Takayuki; and Tsushima, Hiroaki, 4,943,594, Cl. 521-79.000.

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apparatus for controlling an electromagnetic clutch for use on a vehicle. 4,942,950, Cl. 192-0.096.

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Kimoto, Takahiro; Ohi, Hideo; Watanabe, Toshihisa; and Nakayama, Tadashi, 4,943,675, Cl. 544-330.000.

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Jones, Jimmie J.; Watson, Sherman L.; and Pence, Charles F., 4,942,701, Cl. 52-126.100.

Wayne, Wayman. Large truck remote wheel trouble warning system. 4,943,798, Cl. 340-443.000.

Webber, Harold H., Jr., to Farallon Computing Corporation. Local access network signal regnerator. 4,943,979, Cl. 375-4.000.

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Alden, J. Michael; Schlosser, Erich J.; and Stephen, James C., 4,942,862, Cl. 126-337.00R.

Wedel, Gregory L., to Beloit Corporatioe. Transfer apparatus and method. 4,943,351, Cl. 162-205.000.

Wedeniwski, Horst J., to Fortuna-Werke Maschinenfabrik GmbH. Method for cylindrical surface grinding of workspaces. 4,942,695, Cl. 51-165.00R.

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Weete, John D.; and Griffith, George L., to Emulsion Technology, Inc. Emulsifier for water-in-oil emulsions. 4,943,389, Cl. 252-308.000.

Wegel, Peter: *See*—
Dietz, Gunter; Dabringhaus, Volker; and Wegel, Peter, 4,943,124, Cl. 312-222.000.

Wehrenberg, Thomas M.: *See*—
McGarry, Charles N.; Miller, Clarence W. J.; and Wehrenberg, Thomas M., 4,943,544, Cl. 501-124.000.

Wei, Hsu C. Self-shining artificial jewelry device. 4,942,744, Cl. 63-26.000.

Weinstein, Richard, to Illinois Tool Works, Inc. Rotary atomizing device. 4,943,005, Cl. 239-223.000.

Weinstein, Richard, to Illinois Tool Works, Inc. Mounting structure for rotating bodies. 4,943,178, Cl. 403-259.000.

Weitkamp, Claus: *See*—
Michaelis, Walfried; and Weitkamp, Claus, 4,943,161, Cl. 356-437.000.

Welch, James G.: *See*—
Seamans, James D.; Welch, James G.; and Gasser, Neal G., 4,943,547, Cl. 502-150.000.

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Welker, Thomas F., 4,942,772, Cl. 73-863.830.

Welker, Thomas F., to Welker Engineering Company. Stack sampling system. 4,942,772, Cl. 73-863.830.

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Grinberg, Jan; O'Meara, Thomas R., Jr.; and Welkowsky, Murray S., 4,943,709, Cl. 250-201.900.

Welsch, Hans-Jurgen: *See*—
Hellermann, Eberhard; and Welsch, Hans-Jurgen, 4,942,980, Cl. 221-244.000.

Welsch, Wolfgang: *See*—
Krueger, Hans; and Welsch, Wolfgang, 4,943,972, Cl. 372-107.000.

Weng, Chan H.: *See*—
Teck, Yap Y.; Wah, Lim T.; Geok, Anna T. K.; and Weng, Chan H., 4,943,244, Cl. 439-567.000.

Wenger Corporation: *See*—
Krumholz, Frank C.; and Jines, Michael D., 4,942,708, Cl. 52-263.000.

Werner, Jean-Jacques, to AT&T Company. Spread-spectrum identification signal for communications system. 4,943,973, Cl. 375-1.000.

Westendorf, Helmut: *See*—
Radovan, Giuseppe; Blaseck, Klaus; Hoffmeister, Lothar; Westendorf, Helmut; Sandling, Michael J.; and Davidson, James W., 4,942,897, Cl. 137-454.200.

Western Atlas International, Inc.: *See*—
Beasley, Craig J.; Lynn, Walter S.; and Chambers, Ronald E., 4,943,950, Cl. 367-50.000.

Western, Edward D.: *See*—
Dyksterhouse, Robert; Dyksterhouse, Joel A.; Handermann, Alan C.; and Western, Edward D., 4,943,472, Cl. 428-240.000.

Westinghouse Electric Corp.: *See*—
Fox, David A.; and Billings, William W., 4,943,761, Cl. 323-283.000.
Ponce, Hector O.; and Prole, Aleksandar, 4,943,749, Cl. 310-260.000.

Westphal, Dietmar B.: *See*—
Jackman, Dennis E.; Combs, Gary W.; and Westphal, Dietmar B., 4,943,660, Cl. 564-18.000.

Weyand, Thomas E.: *See*—
Gilbert, Stanley R.; and Weyand, Thomas E., 4,943,368, Cl. 209-2.000.

Whelen, Richard J. Manually variable light filtering sunglasses. 4,943,152, Cl. 351-49.000.

Whirlpool Corporation: *See*—
Linstromberg, William J.; Janke, Donald E.; and Scriber, Chris A., 4,942,979, Cl. 221-75.000.

White, Kenneth L.: *See*—
Hartwigsen, Wesley D.; Johnson, Alan D.; Beckham, Jeffrey C.; and White, Kenneth L., 4,942,982, Cl. 222-195.000.

White, Wood G. Contractors' caddy. 4,942,990, Cl. 224-42.420.

Whiteman, Marvin E., Jr. Centrifugal clutch with belt tightening spacer assembly. 4,943,264, Cl. 474-13.000.

Whitmore, Henry B.: *See*—
Thornton, William E., Jr.; and Whitmore, Henry B., 4,942,632, Cl. 4-661.000.

Wickesberg, Donald L.: *See*—
Wimberger, Richard J.; Wickesberg, Donald L.; and Carman, Richard A., 4,942,676, Cl. 34-51.000.

Wickmann, John T.; and Carlton, Phillip, to Chart Industries Ltd. Apparatus for measuring camber, caster and steering axis inclination of a vehicle. 4,942,666, Cl. 33-203.180.

Wiedenfeld, Walter: *See*—
Reymann, Wolfgang; Gropp, Heiko-Ulrich; Vogel, Klaus; Muller, Hartwig; and Wiedenfeld, Walter, 4,943,229, Cl. 425-535.000.

Wiegel, Thomas. Space unit for the recording and/or reproduction of acoustic signals. 4,942,938, Cl. 181-30.000.

Wieldraaijer, Jan: *See*—
Van Aller, Gerardus; and Wieldraaijer, Jan, 4,943,711, Cl. 250-213.0VT.

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Hoffmann, Martin; Schittenheim, Helge; Wierschem, Franz-Rudolf; and Eichhorn, Horst, 4,943,028, Cl. 248-548.000.

Wignes., Bruce D.; and Rohde, Thomas D., to University of Minnesota, Regents of the. Solvent system for chronic vascular infusion of hydrophobic drugs. 4,943,560, Cl. 514-11.000.

Wilby, John L., to Northern Telecom Limited. Thick film packages with common wafer aperture placement. 4,943,845, Cl. 357-74.000.

Wilder, Richard L., to Tahoe Products Incorporated. Motion detector. 4,943,712, Cl. 250-221.000.

Wilhelm, Neil C.; and Leonard, Judson S., to Digital Equipment Corporation. Apparatus and method for synchronization of a coprocessor unit in a pipelined central processing unit. 4,943,915, Cl. 364-200.000.

Wilkerson, Alan W.: *See*—
Linke, Thomas A.; Wilkerson, Alan W.; and Parida, Ashok K., 4,942,795, Cl. 83-72.000.

Willeke, Horst, to Salzgitter AG. Process and apparatus for rolling structural shapes. 4,942,753, Cl. 72-178.000.

Willgerodt, Udo: *See*—
Walz, Reinhold; Hildebrandt, Klaus; and Willgerodt, Udo, 4,942,828, Cl. 108-55.500.

Williams, Bruce R.: *See*—
Horvath, Bruce B.; Hurlbut, Raymond A.; DiFranco, A. Thomas; and Williams, Bruce R., 4,942,998, Cl. 228-102.000.

Williams Dental Company, Inc.: *See*—
Ingersoll, Clyde E.; Schaffer, Stephen P.; and McCabe, Patrick J., 4,943,483, Cl. 428-433.000.

Williams Electronics Games, Inc.: *See*—
Grabel, Irwin J., 4,943,061, Cl. 273-127.00R.

Williams, Joel R. Device for compressing empty cans. 4,942,812, Cl. 100-214.000.

Williams, Roger A.: *See*—
Masters, William E.; and Williams, Roger A., 4,942,840, Cl. 114-363.000.

Willoughby, Brian D.; and Roy, Carl W., II. Remotely activated, nonobvious prisoner control apparatus. 4,943,885, Cl. 361-232.000.

Wilsman, James F.: *See*—
Reinhold, John E.; and Wilsman, James F., 4,942,846, Cl. 119-103.000.

Wilson, Bill B.: *See*—
Colleran, Stephen A.; Gugelmeyer, Robert J.; and Wilson, Bill B., 4,943,248, Cl. 439-850.000.

Wilson, Martin N.; and Finlan, Martin F., to Oxford Instruments, Ltd.; and Amersham International PLC. Cyclotron with yokeless superconducting magnet. 4,943,781, Cl. 328-234.000.

Wilson, Syd R.; Sellers, James A.; and Mattox, Robert J., to Motorola, Inc. Process for making a multilayer metallization structure. 4,943,539, Cl. 437-195.000.

Wilzbach, Bernard L.: *See*—
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Wimberger, Richard J.; Wickesberg, Donald L.; and Carman, Richard A., to W. R. Grace & Co.-Conn. Control system for air flotation dryer with a built-in afterburner. 4,942,676, Cl. 34-51.000.

Winiger, Peter: *See*—
Oetliker, Hans; Winiger, Peter; and Stempfel, Sonja, 4,943,159, Cl. 356-73.000.

Winston, Anthony E.; and Miskewitz, Regina M., to Church & Dwight Co., Inc. Dentifrice gels containing sodium bicarbonate. 4,943,429, Cl. 424-52.000.

Winthrop, John T.; Menyhart, Alexander F.; and Duszlak, James, to American Optical Corporation. Blocking shim and method for prescription-laboratory processing of aspheric progressive-addition lenses. 4,942,696, Cl. 51-277.000.

Winton, Robert A.: *See*—
Ellison, Thomas M.; and Winton, Robert A., 4,943,680, Cl. 427-154.000.

Wirth, Hermann O.: *See*—
Phillips, Emyr; Neil, Robert M.; and Wirth, Hermann O., 4,943,381, Cl. 252-51.50R.

Wisbey, Jerry D., to Cincinnati Milacron Inc. Multi-tow fiber placement machine with full band width clamp, cut, and restart capability. 4,943,338, Cl. 156-433.000.

Wise, James H., to AMP Incorporated. Annular electrical terminal. 4,943,247, Cl. 439-883.000.

Wolf, Anthony D.: *See*—
Hay, James V.; and Wolf, Anthony D., 4,943,312, Cl. 71-90.000.

Wolfberg, Robert L.; Golsch, Rudolph A. M.; and Howard, Frank C., to Illinois Tool Works, Inc. Fastener-driving tool. 4,942,996, Cl. 227-136.000.

Wollan, John J.: *See*—
Srivastava, Vishnu C.; and Wollan, John J., 4,943,792, Cl. 335-216.000.

Wolter, Herbert: *See*—
Sucrow, Wolfgang; Wolter, Herbert; and Eidenschink, Rudolf, 4,943,384, Cl. 252-299.610.

Wong, Don M. Turning mechanism. 4,942,807, Cl. 99-348.000.

Wong, Pui-Kwan, to Shell Oil Company. Modified bisphenols containing arylcyclobutenealkyl ethers and cured compositions therefrom. 4,943,665, Cl. 568-633.000.

Woo, Edmund P.; and Mullins, Michael J., to Dow Chemical Company, The. Preparation of 5-(1-alkyl-carbonyloxy)alkylpyrrolidin-2-one. 4,943,640, Cl. 548-551.000.

Wood, Lesley A.: *See*—
Thompson, Philip W.; and Wood, Lesley A., 4,943,535, Cl. 435-311.000.

Woodard, Floyd E.; and Zeable, Zane V., to Monsanto Company. Optical element for a vehicle windshield. 4,943,140, Cl. 350-164.000.

Woods, Robert J.: *See*—
Fiet, Zeev; Kostyk, Douglas; and Woods, Robert J., 4,943,971, Cl. 372-46.000.

Woodward, Sandra S.: *See*—
Pechanek, Gerald G.; Shippy, David J.; Snedaker, Mark C.; and Woodward, Sandra S., 4,943,984, Cl. 375-109.000.

Worcester Polytechnic Institute: *See*—
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Worger, William R.: *See*—
Piosenka, Gerald V.; Worger, William R.; and Savage, Michael A., 4,944,008, Cl. 380-46.000.

Wright State University: *See*—
Lucot, James B.; and Crampton, George H., 4,943,428, Cl. 424-10.000.

Wright, William D.; and Snyder, George K., to General Motors Corporation. Method for assembly of serpentine heat exchanger. 4,942,654, Cl. 29-890.035.

Wrue, Richard J.: *See*—
Deichert, William G.; and Wrue, Richard J., 4,943,150, Cl. 351-177.000.

Wustrau, Rolf: *See*—
Frankeny, Richard F.; Haj-ali-Ahmadi, Javad; Imken, Ronald L.; and Wustrau, Rolf, 4,943,242, Cl. 439-65.000.

Xerox Corporation: *See*—
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Yu, Robert C. U., 4,943,508, Cl. 430-129.000.

Xomox Limited: *See*—
Radovan, Giuseppe; Blaseck, Klaus; Hoffmeister, Lothar; Westendorf, Helmut; Sandling, Michael J.; and Davidson, James W., 4,942,897, Cl. 137-454.200.

Xydeas, Costas: *See*—
Gouvianakis, Nikolaos; and Xydeas, Costas, 4,944,013, Cl. 381-38.000.

Y-Tex Corporation: *See*—
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Yabe, Masao: *See*—
Okazaki, Masaki; Yabe, Masao; and Kawatta, Ken, 4,943,515, Cl. 430-270.000.

Yablokov, Evgeny G.: *See*—
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Yacht-Yok, A California Partnership: *See*—
Jacobs, Gregory A.; and Neal, Merrill G., 4,942,745, Cl. 70-58.000.

Yagi, Michio: *See*—
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Yagihara, Hiroshi: *See*—
Goto, Yukihisa; Masamoto, Kazuhisa; Yagihara, Hiroshi; Morishima, Yasuo; and Osabe, Hirokazu, 4,943,314, Cl. 71-94.000.

Yahara, Toshihiko, to Mitsubishi Denki Kabushiki Kaisha. Wiring structure for semiconductor integrated circuit device. 4,943,841, Cl. 357-45.000.

Yako, Katsutoshi: *See*—
Horikawa, Hiroshi; Urabe, Hitoshi; and Yako, Katsutoshi, 4,943,869, Cl. 358-426.000.

Yakushiji, Shigenori; and Jitsukata, Kouji, to Kabushiki Kaisha Toshiba. Semiconductor device including protecting MOS transistor. 4,943,835, Cl. 357-23.130.

Yamada, Akira: *See*—
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Yamada, Tohru: *See*—
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Yamada, Yasuhiro: *See*—
Ikeda, Masami; Yamada, Yasuhiro; Tuji, Mahito; Tamano, Akimasa; and Mizoguchi, Yasunari, 4,943,800, Cl. 340-567.000.

Yamada, Yasuyuki; Nagao, Matoko; and Morita, Kazuhiko, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,943,479, Cl. 428-331.000.

Yamagishi, Mikio: *See*—
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Yamaguchi, Isao: *See*—
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Yamaguchi Pearl, Co., Ltd.: *See*—
Ozawa, Kazuhiro; Nakajima, Etsuo; and Yamaguchi, Isao, 4,943,326, Cl. 148-11.50N.

Yamaguchi, Seiji: *See*—
Hayashi, Nobuhiro; Tanaka, Toshiichiro; Yamaguchi, Seiji; and Imai, Hidetoshi, 4,942,640, Cl. 15-319.000.

Yamaguchi, Yasunori; Oishi, Kanji; and Miyazawa, Kazuyuki, to Hitachi, Ltd. Semiconductor memory including means for noise suppression. 4,943,949, Cl. 365-206.000.

Yamaguchi, Yoshiharu: *See*—
Takahashi, Mizunori; Ikeda, Tsuyoshi; and Yamaguchi, Yoshiharu, 4,943,608, Cl. 524-272.000.

Yamaha Corporation: *See*—
Noro, Masao, 4,943,956, Cl. 367-137.000.
Noro, Masao, 4,944,020, Cl. 381-96.000.
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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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Lerach, Thomas E.; and Meron, Abraham, 4,943,251, Cl. 440-28.000.
Yoshikawa, Masaaki, 4,942,857, Cl. 123-193.00H.

Yamamoto, Fumiaki; Otsuka, Tsutomu; and Funo, Yasuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for operating nuclear electric power generating plants. 4,943,408, Cl. 376-210.000.

Yamamoto, Kazushi: *See*—
Awamura, Masaki; Yamamoto, Kazushi; and Nanjo, Masashi, 4,943,431, Cl. 424-70.000.

Yamamoto, Kenji: *See*—
Kumano, Masafumi; and Yamamoto, Kenji, 4,943,839, Cl. 357-30.000.

Yamamoto, Tetsu: *See*—
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Yamamoto, Toshimasa; and Nishimura, Yuji, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusko. Acceleration sensor. 4,943,010, Cl. 242-107.40A.

Yamamoto, Toshinori: *See*—
Ujimoto, Hiroshi; Nomura, Hironori; and Yamamoto, Toshinori, 4,943,340, Cl. 156-496.000.

Yamamura, Katsumi: *See*—
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Yamanaka, Hisashi: *See*—
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Yamanaka, Tooru: *See*—
Nishiyama, Shinichi; Yamaoka, Hideo; Yamanaka, Tooru; and Yamada, Tohru, 4,943,651, Cl. 560-56.000.

Yamanouchi, Kouichi: *See*—
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Yamaoka, Hideo: *See*—
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Yamasa Shoyu Kabushiki Kaisha: *See*—
Yazaki, Yoshio; and Sugi, Masahito, 4,943,427, Cl. 424-1.100.

Yamasaki, Yasuyuki: *See*—
Okinaga, Takayuki; Tachi, Hiroshi; Ozaki, Hiroshi; Otsuka, Kanji; Furukawa, Michiaki; and Yamasaki, Yasuyuki, 4,943,843, Cl. 357-70.000.

Yamashita, Hiroshi, to Kabushiki Kaisha Toshiba. Device for detecting the position of an optical head. 4,943,166, Cl. 369-32.000.

Yamashita, Kiyoshi: *See*—
Shibata, Hiroki; Takahashi, Kazuki; Tajima, Keiichi; Kurita, Takashi; Wada, Kiyoshi; and Yamashita, Kiyoshi, 4,943,893, Cl. 362-37.000.

Yamashita, Seisuke, to Fuji Electric Co., Ltd. Display panel. 4,943,143, Cl. 350-339.00R.

Yamasu Co., Ltd.: *See*—
Yokozuka, Tsuchiyasu, 4,942,879, Cl. 128-684.000.

Yamawaki, Takashi, to Idemitsu Petrochemical Company Limited; and Neste Oy. Olefin copolymer composition. 4,943,615, Cl. 525-240.000.

Yamaya, Masaaki: *See*—
Itagaki, Akinari; Yamaya, Masaaki; Yoshioka, Hiroshi; Watanabe, Akihiko; and Miyazato, Keita, 4,943,452, Cl. 427-299.000.

Yamazaki, Kikuo: *See*—
Kitada, Akira; Yamazaki, Kikuo; Matsuda, Terumi; and Kawagoe, Jun, 4,943,727, Cl. 250-483.100.

Yamazaki, Shohei, to Yamaha Corporation. System of fast reproduction at non-integral multiple of normal playback speed. 4,943,872, Cl. 360-8.000.

Yamazaki, Takeo; Ogihara, Satoru; Kosugi, Tetsuo; Shirakawa, Shingo; and Owada, Shinichi, to Hitachi, Ltd. Oxide resistor. 4,943,795, Cl. 338-21.000.

Yanagawa, Masahiro; Abe, Mutsumi; Aota, Kenichi; and Motoda, Takashi, to Kabushiki Kaisha Kobe Seiko Sho. Process for producing highly functional composite material and composite material obtained thereby. 4,943,319, Cl. 75-229.000.

Yanagi, Hideo: *See*—
Endo, Shigeo; Kawashima, Haruo; Hirata, Kimio; Saito, Yasuo; Uchiya, Takao; and Yanagi, Hideo, 4,943,398, Cl. 264-82.000.
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Yarbrough, Roy L.: *See*—
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Yarita, Takao; Moro, Yutaka; Takeishi, Kazuvasu; and Ohashi, Shinichi, to Ichikawa Woolen Textile Co., Ltd. Controlling and supervising system for loom. 4,943,927, Cl. 364-470.000.
Yasuda, Sachiko: *See*—
Tomura, Shinya; and Yasuda, Sachiko, 4,943,504, Cl. 430-102.000.
Yasujima, Kenji; and Hashimoto, Masao, to Ricoh Company, Ltd. Method of creating dictionary for character recognition. 4,944,022, Cl. 382-14.000.
Yasumoto, Yoshio: *See*—
Kageyama, Sadashi; Abe, Yoshio; Yasumoto, Yoshio; Inoue, Shuji; Takai, Hitoshi; Matsumoto, Mitsujiro; Aono, Kouji; Uchimura, Kiyoshi; and Eiji, Iwasaki, 4,944,032, Cl. 358-12.000.
Yatagai, Masanobu; and Ohnuki, Takashi, to Ajinomoto Co., Inc. Process for asymmetrically reducing carbonyl compounds. 4,943,652, Cl. 560-60.000.
Yates, Chester R.: *See*—
Scott, Terence A.; and Yates, Chester R., 4,942,636, Cl. 5-475.000.
Yazaki Corporation: *See*—
Watanabe, Mitsugu; Kaneko, Kazuhiko; and Matsumoto, Etsuji, 4,943,241, Cl. 439-34.000.
Yoshida, Kunio, 4,942,672, Cl. 33-832.000.
Yazaki, Yoshio; and Sugi, Masahito, to Yamasa Shoyu Kabushiki Kaisha. Diagnostic agent for heart disease and use thereof. 4,943,427, Cl. 424-1.100.
Yeang-Yai, Her. Double-purpose hand tool. 4,942,637, Cl. 7-135.000.
Yen, Huan W.: *See*—
Stephens, Ronald R.; Craig, Richard R.; Yen, Huan W.; and Lind, Richard C., 4,943,782, Cl. 330-4.300.
Yokohama Rubber Co., Ltd., The: *See*—
Takahashi, Ken; Kabe, Kazuyuki; and Suzuki, Tatsuo, 4,942,914, Cl. 152-531.000.
Takemae, Eiji; Koizumi, Masakazu; and Ishibashi, Tadashi, 4,942,905, Cl. 138-118.000.
Yokota, Keiichi, to Tokyo Electron Limited. Automatic wafer position aligning method for wafer prober. 4,943,767, Cl. 324-158.00F.
Yokoyama, Fumitomo: *See*—
Kuwayama, Yoshinari; Yokoyama, Fumitomo; and Miura, Masakatsu, 4,942,782, Cl. 74-866.000.
Yokoyama, Kazumasa: *See*—
Scherer, Kirby V., Jr.; Yamanouchi, Kouichi; Yokoyama, Kazumasa; and Naito, Ryoichi, deceased, 4,943,595, Cl. 514-722.000.
Yokoyama, Shinichi: *See*—
Zyogahara, Masakazu; Yokoyama, Shinichi; and Yamanaka, Hisashi, 4,943,263, Cl. 464-180.000.
Yokoyama, Shouji: *See*—
Moroto, Shuzo; Sumiya, Koji; Yokoyama, Shouji; Nimura, Mitsuhiro; and Nanba, Akimasa, 4,943,925, Cl. 364-449.000.
Yokoyama, Takayuki; and Kyoden, Yasuhiro, to Minolta Camera Kabushiki Kaisha. Thermal transfer type color recording method and apparatus therefor. 4,943,812, Cl. 346-1.100.
Yokoyama, Yoshihiro: *See*—
Izuno, Nobuaki; Kurosu, Yasuo; Okazawa, Koichi; Yokoyama, Yoshihiro; and Ooyu, Kensuke, 4,943,857, Cl. 358-148.000.
Yokozuka, Tsuchiyasu, to Yamasu Co., Ltd. Mercury sphygmomanometer. 4,942,879, Cl. 128-684.000.
Yoneyama, Masakazu; and Mukunoki, Yasuo, to Fuji Photo Film Co., Ltd. Silver halide photographic material containing antistatic agents. 4,943,520, Cl. 430-527.000.
Yonezawa, Shigeki: *See*—
Boyer, Kirk A.; and Yonezawa, Shigeki, 4,942,838, Cl. 114-345.000.
Yoo, Youngtai: *See*—
McGrath, James E.; Yoo, Youngtai; Turner, Robert B.; and Lewis, Diane M., 4,943,626, Cl. 528-408.000.
Yoshida, Hajime, to Hajime Industries Ltd. Bottle bottom inspection apparatus. 4,943,713, Cl. 250-223.00B.
Yoshida, Hiroshi, to Yoshida Kogyo K. K. Separable type water-resistant slide fasteners. 4,942,648, Cl. 24-389.000.
Yoshida Kogyo K. K.: *See*—
Yoshida, Hiroshi, 4,942,648, Cl. 24-389.000.
Yoshida, Kunio, to Yazaki Corporation. Method of measuring the height of burrs and a burr measuring head. 4,942,672, Cl. 33-832.000.
Yoshida, Osamu: *See*—
Sakamoto, Keiji; and Yoshida, Osamu, 4,943,759, Cl. 318-568.110.
Yoshida, Toshihiro: *See*—
Sano, Masaaki; Imagawa, Takao; Nishioka, Kouichi; Narishige, Shinji; Hanazono, Masanobu; Onishi, Takashi; and Yoshida, Toshihiro, 4,943,883, Cl. 360-126.000.
Yoshida, Yoshio: *See*—
Uda, Akira; Yoshida, Yoshio; Harada, Makoto; and Sato, Masaaki, 4,942,739, Cl. 62-93.000.
Yoshikawa, Masaaki, to Yamaha Hatsudoki Kabushiki Kaisha. Combustion chamber for engine with multiple valves. 4,942,857, Cl. 123-193.00H.
Yoshimura, Susumu: *See*—
Tsuchiya, Sohji; Kudoh, Yasuo; Kojima, Toshikuni; Fukuyama, Masao; and Yoshimura, Susumu, 4,943,892, Cl. 361-525.000.
Yoshinaga, Yoshio; Shimizu, Wataru; and Obara, Toshio, to Kabushiki Kaisha Toshiba. Handy image data filing apparatus. 4,943,868, Cl. 358-403.000.
Yoshino, Hirobumi; Ito, Takashige; Kawase, Junichi; and Maeda, Hiroyuki, to Ricoh Company, Ltd. Operational condition setting device for an office machine. 4,944,031, Cl. 355-206.000.
Yoshino, Yasuhisa: *See*—
Takeda, Kenji; Kamiya, Sigeru; Suzuki, Satosi; and Yoshino, Yasuhisa, 4,943,123, Cl. 303-111.000.
Yoshioka, Hiroshi: *See*—
Itagaki, Akinari; Yamaya, Masaaki; Yoshioka, Hiroshi; Watanabe, Akihiko; and Miyazato, Keita, 4,943,452, Cl. 427-299.000.
Yoshioka, Koichi: *See*—
Kambe, Koichi; Matsuura, Kiyoshi; Seino, Tatsuo; Kimura, Yoshiyuki; Kemmochi, Hiroshi; Yoshioka, Koichi; and Hohnoki, Hideaki, 4,943,418, Cl. 423-50.000.
Yoshioka, Satoru: *See*—
Takada, Hiromi; Suzuki, Takami; Shiina, Toshio; Okamoto, Keiji; Komurasaki, Takeshi; Yoshioka, Satoru; Sakuma, Nobuo; and Matsuura, Tadashi, 4,943,128, Cl. 350-6.900.
Yoshioka, Tatsuya: *See*—
Nakamura, Kazuhiro; Yoshioka, Tatsuya; Sawada, Ryoji; and Nakamura, Tomoji, 4,943,777, Cl. 324-433.000.
Yoshitake, Akira: *See*—
Kuhara, Akio; Yoshitake, Akira; Torigoe, Takeshi; and Amako, Shinji, 4,943,489, Cl. 428-586.000.
Yoshizawa, Hideo: *See*—
Kinoshita, Akira; Matsuzawa, Yumi; and Yoshizawa, Hideo, 4,943,501, Cl. 430-58.000.
Yoshizawa, Mitsuru: *See*—
Hirai, Ryoji; Yoshizawa, Mitsuru; and Ikeda, Hiroyuki, 4,943,754, Cl. 313-477.00R.
Yoshizawa, Tomomi; Ogi, Keiji; Tosaka, Yasuo; Kuramoto, Kazuya; and Nonaka, Yoshiyuki, to Konica Corporation. Direct-positive silver halide photographic light-sensitive material and method of processing it. 4,943,518, Cl. 430-378.000.
Yotumoto, Yoshiharu: *See*—
Sugita, Naomasa; Yotumoto, Yoshiharu; Moriguchi, Kouji; and Sekiba, Toshinobu, 4,943,842, Cl. 357-51.000.
Young, John C.: *See*—
Chou, Der-Jeou; and Young, John C., 4,942,863, Cl. 126-110.00E.
Young, John S.; Kruis, Peter; and Blewitt, William D., to AG Communication Systems Corporation. ISDN interface trunk circuit. 4,943,958, Cl. 370-77.000.
Young, Roger A., to Phillips Petroleum Company. Seismic data processing method. 4,943,918, Cl. 364-421.000.
Yu-Fu Traffic Supplier Ltd., Co.: *See*—
Lin, Chuan-Sheng; and Lii, Wei, 4,943,077, Cl. 280-260.000.
Yu, Robert C. U., to Xerox Corporation. Method of fabricating a layered flexible electrophotographic imaging member. 4,943,508, Cl. 430-129.000.
Yu, Ruey J.: *See*—
Pelley, Perry H., III; and Yu, Ruey J., 4,943,743, Cl. 307-475.000.
Yu, Yunzhao: *See*—
Bell, James P.; and Yu, Yunzhao, 4,943,619, Cl. 525-463.000.
Yuasa, Kazumasa: *See*—
Nozawa, Yusaku; Yuasa, Kazumasa; Ootu, Wataru; and Takahashi, Kinya, 4,942,900, Cl. 137-490.000.
Yugen Kaisha Chubuseimitsu: *See*—
Shiozawa, Shinichi, 4,943,748, Cl. 310-67.00R.
Yumura, Takashi: *See*—
Mizuno, Shigeki; Ueda, Takaharu; Yamamoto, Tetsu; and Yumura, Takashi, 4,943,147, Cl. 350-486.000.
Zaghloul, Amir I., to Communications Satellite Corporation. Electromagnetically coupled microstrip antennas having feeding patches capacitively coupled to feedlines. 4,943,809, Cl. 343-700.0MS.
Zanakis, Michael F.: *See*—
Femano, Philip A.; and Zanakis, Michael F., 4,943,852, Cl. 358-88.000.
Zander, Maximilian: *See*—
Boenigk, Winfried; Zander, Maximilian; and Stadelhofer, Jurgen, 4,943,365, Cl. 208-44.000.
Zani, Bruno; and Zani, Duilio, to Zani S.r.l. Opening and closing controls of roofs for vehicles. 4,943,104, Cl. 296-223.000.
Zani, Duilio: *See*—
Zani, Bruno; and Zani, Duilio, 4,943,104, Cl. 296-223.000.
Zani S.r.l.: *See*—
Zani, Bruno; and Zani, Duilio, 4,943,104, Cl. 296-223.000.
Zarnko, Martin; and Sehr, Willibald, to MOBA - Electronic. Height control device and method for a fixture for machining an object essentially defined by a single plane. 4,943,119, Cl. 299-1.000.
Zarycki, John E.: *See*—
Quirk, Michael J.; Drake, Timothy E.; and Zarycki, John E., 4,942,776, Cl. 74-61.000.
Zatulovsky, Leonid, to Allegretti & Company. String trimmer with automatic feed. 4,942,664, Cl. 30-276.000.
Zdeblick, Mark, to Stanford University. Integrated, microminiature electric to fluidic valve and pressure/flow regulator. 4,943,032, Cl. 251-11.000.
Zeable, Zane V.: *See*—
Woodard, Floyd E.; and Zeable, Zane V., 4,943,140, Cl. 350-164.000.
Zeiler, Hans-Joachim: *See*—
Boberg, Michael; Angerbauer, Rolf; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,943,568, Cl. 514-206.000.

Zejda, Jaroslav; and Schuhmacher, Manfred, to Leybold Aktiengesellschaft. Cathode sputtering system. 4,943,363, Cl. 204-298.150.
Zenith Electronics Corporation: *See*—
Citta, Richard W.; Gosc, Paul M.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., 4,944,006, Cl. 380-20.000.
Zimmer, Johannes. Process and device for applying a flowable substance to a surface. 4,943,451, Cl. 427-294.000.
Zimmer S.A.: *See*—
Tanguy, Christian, 4,943,291, Cl. 606-64.000.
Zimmermann, Peter H.: *See*—
Norton, Peter W.; Stobie, James A.; and Zimmermann, Peter H., 4,943,491, Cl. 428-620.000.
Zinser Textilmaschinen GmbH: *See*—
Guttler, Hermann; and Mark, Karl-Heinz, 4,942,729, Cl. 57-261.000.
Zircon International, Inc.: *See*—
Franklin, Robert C., 4,942,668, Cl. 33-366.000.
Zittel, David R.; and Robbins, Gregory M., to Lyco Manufacturing, Inc. Water seal blancher. 4,942,810, Cl. 99-477.000.
Zogas, Peter, to Texas Instruments Incorporated. High-density package. 4,943,844, Cl. 357-74.000.
Zumstein, Ronald C.: *See*—
Klobucar, W. Dirk; Eisenbraun, Allan A.; and Zumstein, Ronald C., 4,943,682, Cl. 528-353.000.
Zwahlen, Andreas: *See*—
Siegenthaler, Peter; and Zwahlen, Andreas, 4,942,842, Cl. 118-24.000.
Zyogahara, Masakazu; Yokoyama, Shinichi; and Yamanaka, Hisashi, to Toyota Jidosha Kabushiki Kaisha. Structure for mounting damper on rotary shaft. 4,943,263, Cl. 464-180.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF JULY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Barkhimer, Robert L.: *See*—
Beck, Niels J.; Calkins, Michael A.; Weseloh, William E.; and Barkhimer, Robert L., Re. 33,270, Cl. 123-447.000.

Beck, Niels J.; Calkins, Michael A.; Weseloh, William E.; and Barkhimer, Robert L., to BKM, Inc. Pressure-controlled fuel injection for internal combustion engines. Re. 33,270, Cl. 123-447.000.

BKM, Inc.: *See*—
Beck, Niels J.; Calkins, Michael A.; Weseloh, William E.; and Barkhimer, Robert L., Re. 33,270, Cl. 123-447.000.

Burnham, Robert D.; and Johnson, Noble M., to Xerox Corporation. Selective disordering of well structures by laser annealing. Re. 33,274, Cl. 437-174.000.

Calkins, Michael A.: *See*—
Beck, Niels J.; Calkins, Michael A.; Weseloh, William E.; and Barkhimer, Robert L., Re. 33,270, Cl. 123-447.000.

Coxon, Peter A.: *See*—
Wardell, Ian R. M.; and Coxon, Peter A., Re. 33,275, Cl. 250-305.000.

Georgia Tech Research Corporation: *See*—
Speaker, Lois M., Re. 33,273, Cl. 210-639.000.

Ishikawa, Norio; and Omaki, Takanobu, to Minolta Camera Kabushiki Kaisha. Automatic focusing device for use in a camera. Re. 33,277, Cl. 354-402.000.

Johnson, Noble M.: *See*—
Burnham, Robert D.; and Johnson, Noble M., Re. 33,274, Cl. 437-174.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ishikawa, Norio; and Omaki, Takanobu, Re. 33,277, Cl. 354-402.000.

Omaki, Takanobu: *See*—
Ishikawa, Norio; and Omaki, Takanobu, Re. 33,277, Cl. 354-402.000.

Presholdt, Ogden L. Method and apparatus for separately controlling sky wave and ground wave radiation from a medium wave antenna. Re. 33,276, Cl. 343-725.000.

Shoher, Itzhak; and Whiteman, Aharon. Dental jacket crown, coping and method of construction. Re. 33,271, Cl. 433-222.100.

Speaker, Lois M., to Georgia Tech Research Corporation. Materials having improved nonfouling characteristics and method of making same. Re. 33,273, Cl. 210-639.000.

Turck, Ernst. Filter cartridge for filtering apparatuses. Re. 33,272, Cl. 55-500.000.

VG Instruments Group, Limited: *See*—
Wardell, Ian R. M.; and Coxon, Peter A., Re. 33,275, Cl. 250-305.000.

Wardell, Ian R. M.; and Coxon, Peter A., to VG Instruments Group, Limited. Electron Spectrometer. Re. 33,275, Cl. 250-305.000.

Weseloh, William E.: *See*—
Beck, Niels J.; Calkins, Michael A.; Weseloh, William E.; and Barkhimer, Robert L., Re. 33,270, Cl. 123-447.000.

Whiteman, Aharon: *See*—
Shoher, Itzhak; and Whiteman, Aharon, Re. 33,271, Cl. 433-222.100.

Xerox Corporation: *See*—
Burnham, Robert D.; and Johnson, Noble M., Re. 33,274, Cl. 437-174.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Adams Industries Inc.: *See*—
Howard, H. Keith; and Sherrill, Jimmy L., B1 4,692,599, Cl. 219-532.000.

Baer, Thomas M.; and Keirstead, Mark S., to Spectra-Physics, Inc. ND-YAG Laser. B1 4,653,056, 7-24-90, Cl. 372-75.000.

Bennett, Edward D. Apparatus for producing a blank from stock material. B1 4,267,753, 7-24-90, Cl. 83-124.000.

Canon Kabushiki Kaisha: *See*—
Katagiri, Kazuharu; Oguchi, Yoshihiro; and Takasu, Yoshio, B1 4,481,273, Cl. 430-59.000.

Great Lakes Chemical Corp.: *See*—
Sergent, Rodney H.; and Thanstrom, Kenneth N., B1 4,637,865, Cl. 204-111.000.

Howard, H. Keith; and Sherrill, Jimmy L., to Adams Industries Inc. Coil support insulator for electric heater. B1 4,692,599, 7-24-90, Cl. 219-532.000.

Katagiri, Kazuharu; Oguchi, Yoshihiro; and Takasu, Yoshio, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member and preparation thereof. B1 4,481,273, 7-24-90, Cl. 430-59.000.

Keirstead, Mark S.: *See*—
Baer, Thomas M.; and Keirstead, Mark S., B1 4,653,056, Cl. 372-75.000.

Oguchi, Yoshihiro: *See*—
Katagiri, Kazuharu; Oguchi, Yoshihiro; and Takasu, Yoshio, B1 4,481,273, Cl. 430-59.000.

Rodriguez, Jorge M., to W. R. Grace & Co. Closed cell foam printing blanket. B1 4,303,721, 7-24-90, Cl. 428-213.000.

Sergent, Rodney H.; and Thanstrom, Kenneth N., to Great Lakes Chemical Corp. Process for metal recovery and compositions useful therein. B1 4,637,865, 7-24-90, Cl. 204-111.000.

Sherrill, Jimmy L.: *See*—
Howard, H. Keith; and Sherrill, Jimmy L., B1 4,692,599, Cl. 219-532.000.

Spectra-Physics, Inc.: *See*—
Baer, Thomas M.; and Keirstead, Mark S., B1 4,653,056, Cl. 372-75.000.

Takasu, Yoshio: *See*—
Katagiri, Kazuharu; Oguchi, Yoshihiro; and Takasu, Yoshio, B1 4,481,273, Cl. 430-59.000.

Thanstrom, Kenneth N.: *See*—
Sergent, Rodney H.; and Thanstrom, Kenneth N., B1 4,637,865, Cl. 204-111.000.

W. R. Grace & Co.: *See*—
Rodriguez, Jorge M., B1 4,303,721, Cl. 428-213.000.

LIST OF DESIGN PATENTEES

A.M.S. Packaging: *See*—
Geiger, Reinold, 309,418, Cl. D9-300.000.

Aderman, Wayne L.; Jordan, Willis Y.; Rodd, Timothy J.; and Tennant, Robert P., to International Business Machines Corp. Disk drive. 309,448, 7-24-90, Cl. D14-109.000.

Ahlstroem, Tom E. T.; and Ehrich, Hans O. G., to Colgate-Palmolive Company. Toothbrush. 309,375, 7-24-90, Cl. D4-104.000.

Albert, Samuel. Safety aligning pin. 309,410, 7-24-90, Cl. D8-14.000.

Aldrich, Thomas B., III, to Bristol-Myers Canada Inc. Bottle. 309,421, 7-24-90, Cl. D9-376.000.

Alizard, Michel, to Colgate-Palmolive Company. Bottle and cap. 309,423, 7-24-90, Cl. D9-404.000.

Allen, Kelly M.: *See*—
Freiberger, John G., Jr.; and Allen, Kelly M., 309,476, Cl. D21-69.000.
Freiberger, John G., Jr.; and Allen, Kelly M., 309,477, Cl. D21-69.000.
Freiberger, John G., Jr.; and Allen, Kelly M., 309,478, Cl. D21-69.000.
Freiberger, John G., Jr.; and Allen, Kelly M., 309,479, Cl. D21-69.000.

Allsteel Inc.: *See*—
Buhk, Randall P., 309,381, Cl. D6-360.000.
Buhk, Randall P., 309,382, Cl. D6-360.000.
Buhk, Randall P., 309,384, Cl. D6-366.000.
Buhk, Randall P., 309,385, Cl. D6-366.000.
Buhk, Randall P., 309,386, Cl. D6-379.000.

Amoco Corporation: *See*—
Sheehan, Timothy K., 309,431, Cl. D9-424.000.

Ampex Corporation: *See*—
Staley, Darrell S., 309,455, Cl. D14-239.000.

Ancona, Bruce: *See*—
Ancona, Jane; and Ancona, Bruce, 309,412, Cl. D8-48.000.
Ancona, Jane; and Ancona, Bruce, 309,413, Cl. D8-57.000.

Ancona, Jane; and Ancona, Bruce, to M. Kamenstein, Inc. Staple remover. 309,412, 7-24-90, Cl. D8-48.000.

Ancona, Jane; and Ancona, Bruce, to M. Kamenstein, Inc. Scissors. 309,413, 7-24-90, Cl. D8-57.000.

Appelbaum, Paul. Retractable key holder. 309,373, 7-24-90, Cl. D3-61.000.

Arad, Avi; and Kennedy, Melvin R., to Tiger Electronics, Inc. Skipping toy. 309,484, 7-24-90, Cl. D21-191.000.

Arduini, Giovanni; Bonfanti, Lorenzo; and Salvemini, Gianfranco, to Delta Elettronica S.p.A. Siren for automobiles and the like. 309,440, 7-24-90, Cl. D10-120.000.

Asics Corporation: *See*—
Kayano, Toshikazu, 309,371, Cl. D2-320.000.
Mitsui, Shigeyuki, 309,368, Cl. D2-317.000.
Nagai, Terushige; and Inoue, Shinsuke, 309,370, Cl. D2-320.000.

Bandari, Ardeshir, to Westcan Electrical Manufacturing Inc. Switch housing. 309,447, 7-24-90, Cl. D13-158.000.

Bardes Corporation: *See*—
Taylor, Carl J.; and Whaley, Robert L., 309,377, Cl. D4-130.000.

Bares Group: *See*—
Kiernan, Vincent J., 309,409, Cl. D8-4.000.

Barger, Marc A.; and Dannenberg, Jason. Camouflage pattern. 309,380, 7-24-90, Cl. D5-62.000.

Barnard, John K.; and Brown, David A., to Vita-Mix Corporation; and Flurry International, Inc. Agitator for a food mixer. 309,399, 7-24-90, Cl. D7-412.000.

Barnard, John K., to Vita-Mix Corporation. Ice cream agitator. 309,400, 7-24-90, Cl. D7-412.000.

Bayer, Earl F. Slipper. 309,367, 7-24-90, Cl. D2-304.000.

Beaver, Theodore L., to Clorox Company, The. Bottle. 309,420, 7-24-90, Cl. D9-376.000.

Bell, Donald J., to Don Bell Enterprises, Inc. Oyster opener. 309,408, 7-24-90, Cl. D7-693.000.

Benson, Timothy A.; and Gagnon, Peter R., to GTE Products Corporation. Reflector-type electric lamp or the like. 309,503, 7-24-90, Cl. D26-2.000.

Berg, Catherine L. Bag. 309,419, 7-24-90, Cl. D9-305.000.

Bertlin, Bryan; Enskat, Colin J.; and Breese, Reginald W., to Toly Products (UK) Limited. Cosmetic compact. 309,511, 7-24-90, Cl. D28-78.000.

Bingham, Curt G.; and Dalebout, William T., to Weslo, Inc. Exercise cycle. 309,485, 7-24-90, Cl. D21-194.000.

Boehnke, Ulrich K., to Diemold Machine Company, Inc. In-line water filter. 309,492, 7-24-90, Cl. D23-209.000.

Bonfanti, Lorenzo: *See*—
Arduini, Giovanni; Bonfanti, Lorenzo; and Salvemini, Gianfranco, 309,440, Cl. D10-120.000.

Bowman, Jerald A.; and Hobbs, Richard E., to DePuy, Division of Boehringer Mannheim. Ligament graft passer or similar article. 309,499, 7-24-90, Cl. D24-26.000.

Breese, Reginald W.: *See*—
Bertlin, Bryan; Enskat, Colin J.; and Breese, Reginald W., 309,511, Cl. D28-78.000.

Briggs & Stratton Corporation: *See*—
Eifert, Glen C.; and Green, Thomas J., 309,457, Cl. D15-1.000.
Johnson, Gary S.; and Green, Thomas J., 309,458, Cl. D15-1.000.

Brimms Inc.: *See*—
Olney, Donald, 309,480, Cl. D21-92.000.

Bristol-Myers Canada Inc.: *See*—
Aldrich, Thomas B., III, 309,421, Cl. D9-376.000.

Britz, Gordon D. Combined container with minerals and letter opener. 309,416, 7-24-90, Cl. D8-104.000.

Brown, David A.: *See*—
Barnard, John K.; and Brown, David A., 309,399, Cl. D7-412.000.

Brunner, Robert D.: *See*—
Miller, George E.; Brunner, Robert D.; and Wood, Kenneth D., 309,467, Cl. D16-132.000.

Buhk, Randall P., to Allsteel Inc. Swivel chair. 309,381, 7-24-90, Cl. D6-360.000.

Buhk, Randall P., to Allsteel Inc. Swivel arm chair. 309,382, 7-24-90, Cl. D6-360.000.

Buhk, Randall P., to Allsteel Inc. Seat. 309,384, 7-24-90, Cl. D6-366.000.

Buhk, Randall P., to Allsteel Inc. Seat. 309,385, 7-24-90, Cl. D6-366.000.

Buhk, Randall P., to Allsteel Inc. Arm chair. 309,386, 7-24-90, Cl. D6-379.000.

Bussan, Marc R.; Fellwock, Charles G.; and DeBoer, Jeffrey A., to Whirlpool Corporation. Refrigerator shelf. 309,461, 7-24-90, Cl. D15-89.000.

Buxton, Robert G.: *See*—
MacDonald, Lindsay W.; Buxton, Robert G.; and Grayson, Peter, 309,449, Cl. D14-114.000.

Cain, Ann S., to 'totes', incorporated. Umbrella handle. 309,372, 7-24-90, Cl. D3-12.000.

Carolina Pacific, Inc.: *See*—
Miller, George E.; Brunner, Robert D.; and Wood, Kenneth D., 309,467, Cl. D16-132.000.

Casberg, John M., to Olin Corporation. Chlorine dispenser for swimming pools. 309,493, 7-24-90, Cl. D23-208.000.

CCL Industries, Inc.: *See*—
Sharman, Kenneth T.; and Dawson, Bruce H., 309,435, Cl. D9-435.000.

Cerex Corporation: *See*—
Colvin, Arthur E., Jr., 309,498, Cl. D24-8.000.

Charet, Pierre; and Kraai, Duke. Automobile floor mat. 309,444, 7-24-90, Cl. D12-203.000.

Chef Specialities Company, Inc.: *See*—
Pierotti, John W., 309,403, Cl. D7-594.000.
Pierotti, John W., 309,404, Cl. D7-594.000.
Pierotti, John W., 309,405, Cl. D7-594.000.

Christian Dior, S.A.: *See*—
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Chu, Zooey C.: *See*—
Muller-Deisig, Wolfgang; Jenkins, David C.; West, Terry D.; and Chu, Zooey C., 309,383, Cl. D6-366.000.

Clorox Company, The: *See*—
Beaver, Theodore L., 309,420, Cl. D9-376.000.

Cluff, Kenneth C.: *See*—
Wing, Harold R.; and Cluff, Kenneth C., 309,502, Cl. D25-68.000.

Coca-Cola Company, The: *See*—
Thompson, George L.; Smazik, Kenneth G.; and Kirschner, Jonathan, 309,395, Cl. D7-311.000.

Coleman Outdoor Products, Inc.: *See*—
Lundblade, Gene; and Deines, Robert, 309,396, Cl. D7-313.000.

Colgate-Palmolive Company: *See*—
Ahlstroem, Tom E. T.; and Ehrich, Hans O. G., 309,375, Cl. D4-104.000.
Alizard, Michel, 309,423, Cl. D9-404.000.

Collins, Glenn E.: *See*—
King, Robert O.; and Collins, Glenn E., 309,391, Cl. D6-601.000.

Colton, Steven F., to Vitarine Pharmaceuticals, Inc. Compressed powder tablet. 309,505, 7-24-90, Cl. D28-2.000.

Colvin, Arthur E., Jr., to Cerex Corporation. Chromatography column closure or similar article. 309,498, 7-24-90, Cl. D24-8.000.

Concepcion, Juan F.; Lucas, Michael P.; Tabor, Robert; and Gerstman, Richard B., to Nabisco Brands, Inc. Sandwich cookie. 309,366, 7-24-90, Cl. D1-106.000.

Contrologic, Inc.: *See*—
Goszyk, Kurt, 309,439, Cl. D10-46.000.

Cramer, Ronald G., to S. C. Johnson & Son, Inc. Container. 309,430, 7-24-90, Cl. D9-415.000.

Crosfield Electronics Limited: *See*—
MacDonald, Lindsay W.; Buxton, Robert G.; and Grayson, Peter, 309,449, Cl. D14-114.000.

Crow, Robert W. Cheek flap for a helmet. 309,512, 7-24-90, Cl. D29-16.000.

Culbertson, Richard, to Ericsson GE Mobile Communications Inc. Positive lock hanger for a telephone handset. 309,456, 7-24-90, Cl. D14-253.000.

Dalebout, William T.: *See*—
Bingham, Curt G.; and Dalebout, William T., 309,485, Cl. D21-194.000.

Dannenberg, Jason: *See*—
Barger, Marc A.; and Dannenberg, Jason, 309,380, Cl. D5-62.000.

Davis, Karen J.: *See*—
Davis, Thomas O.; and Davis, Karen J., 309,490, Cl. D21-223.000.

Davis, Thomas O.; and Davis, Karen J. Ball rack. 309,490, 7-24-90, Cl. D21-223.000.

Dawes, Robert, to Turner, Trevor John; and Turner, Kaylene Gail. Handle for utility brushes. 309,379, 7-24-90, Cl. D4-138.000.

Dawson, Bruce H.: *See*—
Sharman, Kenneth T.; and Dawson, Bruce H., 309,435, Cl. D9-435.000.
DeBoer, Jeffrey A.: *See*—
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Deines, Robert: *See*—
Lundblade, Gene; and Deines, Robert, 309,396, Cl. D7-313.000.
Delta Elettronica S.p.A.: *See*—
Arduini, Giovanni; Bonfanti, Lorenzo; and Salvemini, Gianfranco, 309,440, Cl. D10-120.000.
DePuy, Division of Boehringer Mannheim: *See*—
Bowman, Jerald A.; and Hobbs, Richard E., 309,499, Cl. D24-26.000.
Diemold Machine Company, Inc.: *See*—
Boehnke, Ulrich K., 309,492, Cl. D23-209.000.
Don Bell Enterprises, Inc.: *See*—
Bell, Donald J., 309,408, Cl. D7-693.000.
Dudick, George M.: *See*—
McDannel, Richard A.; and Dudick, George M., 309,463, Cl. D15-123.000.
Du Vall, Gregory: *See*—
Hassel, H. Charles; Geist, Kenneth; and Du Vall, Gregory, 309,450, Cl. D14-114.000.
Efco, Inc.: *See*—
McDannel, Richard A.; and Dudick, George M., 309,463, Cl. D15-123.000.
Ehrich, Hans O. G.: *See*—
Ahlstroem, Tom E. T.; and Ehrich, Hans O. G., 309,375, Cl. D4-104.000.
Eifert, Glen C.; and Green, Thomas J., to Briggs & Stratton Corporation. Internal combustion engine. 309,457, 7-24-90, Cl. D15-1.000.
Electroli, S.A.: *See*—
Wodli, Marc, 309,466, Cl. D15-133.000.
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Viklund, Ake E., 309,518, Cl. D34-40.000.
Enskat, Colin J.: *See*—
Bertlin, Bryan; Enskat, Colin J.; and Breese, Reginald W., 309,511, Cl. D28-78.000.
Ericsson GE Mobile Communications Inc.: *See*—
Culbertson, Richard, 309,456, Cl. D14-253.000.
Everett, Kent T. Electric guitar. 309,468, 7-24-90, Cl. D17-14.000.
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Bussan, Marc R.; Fellwock, Charles G.; and DeBoer, Jeffrey A., 309,461, Cl. D15-89.000.
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Flurry International, Inc.: *See*—
Barnard, John K.; and Brown, David A., 309,399, Cl. D7-412.000.
Frank Coleman (Luton) Limited: *See*—
Goldman, Neil V. H., 309,434, Cl. D9-433.000.
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Minuti, Furio, 309,433, Cl. D9-424.000.
Freiberger, John G., Jr.; and Allen, Kelly M. Simulative rocker. 309,476, 7-24-90, Cl. D21-69.000.
Freiberger, John G., Jr.; and Allen, Kelly M. Simulative rocker. 309,477, 7-24-90, Cl. D21-69.000.
Freiberger, John G., Jr.; and Allen, Kelly M. Simulative rocker. 309,478, 7-24-90, Cl. D21-69.000.
Freiberger, John G., Jr.; and Allen, Kelly M. Simulative rocker. 309,479, 7-24-90, Cl. D21-69.000.
Fuke, Mitsutaka, to Sharp Corporation. Combined tape recorder and radio. 309,452, 7-24-90, Cl. D14-163.000.
Gagnon, Peter R.: *See*—
Benson, Timothy A.; and Gagnon, Peter R., 309,503, Cl. D26-2.000.
Geiger, Reinold, to A.M.S. Packaging. Spray dispenser. 309,418, 7-24-90, Cl. D9-300.000.
Geist, Kenneth: *See*—
Hassel, H. Charles; Geist, Kenneth; and Du Vall, Gregory, 309,450, Cl. D14-114.000.
Gerstman, Richard B.: *See*—
Concepcion, Juan F.; Lucas, Michael P.; Tabor, Robert; and Gerstman, Richard B., 309,366, Cl. D1-106.000.
Glaxo Inc.: *See*—
Shurkus, Daniel, 309,506, Cl. D28-2.000.
Goldman, Neil V. H., to Frank Coleman (Luton) Limited. Blank for a container. 309,434, 7-24-90, Cl. D9-433.000.
Goszyk, Kurt, to Contrologic, Inc. Non-contact optical gauge. 309,439, 7-24-90, Cl. D10-46.000.
Grayson, Peter: *See*—
MacDonald, Lindsay W.; Buxton, Robert G.; and Grayson, Peter, 309,449, Cl. D14-114.000.
Green, Thomas J.: *See*—
Eifert, Glen C.; and Green, Thomas J., 309,457, Cl. D15-1.000.
Johnson, Gary S.; and Green, Thomas J., 309,458, Cl. D15-1.000.
Grimm, Barbara A. Wicker container. 309,424, 7-24-90, Cl. D9-414.000.
Grimm, Barbara A. Wicker container. 309,425, 7-24-90, Cl. D9-414.000.
Grimm, Barbara A. Wicker container. 309,426, 7-24-90, Cl. D9-414.000.
Grimm, Barbara A. Wicker container. 309,427, 7-24-90, Cl. D9-414.000.
Grimm, Barbara A. Wicker container. 309,428, 7-24-90, Cl. D9-414.000.
Grimm, Barbara A. Wicker container. 309,429, 7-24-90, Cl. D9-414.000.
Gross, Dennis M. Tillage point tooth. 309,460, 7-24-90, Cl. D15-29.000.
GTE Products Corporation: *See*—
Benson, Timothy A.; and Gagnon, Peter R., 309,503, Cl. D26-2.000.
Guenette, Lauren D.; and Nybo, Gregg A. Practice hockey net attachment. 309,486, 7-24-90, Cl. D21-200.000.
H. H. Brown Shoe Company, Inc.: *See*—
Issler, James E., 309,369, Cl. D2-320.000.
Hafvenstein, Philip A.; and Heeren, Paul C. Cover for an inflatable beach pillow. 309,392, 7-24-90, Cl. D6-601.000.
Hanson, Mark L., to MinnFac, Inc. Deck light. 309,504, 7-24-90, Cl. D26-68.000.
Harper-Wyman Company: *See*—
Lund, Lyle B., 309,398, Cl. D7-407.000.
Hassel, H. Charles; Geist, Kenneth; and Du Vall, Gregory, to MicroComputer Accessories, Inc. Computer mouse pad. 309,450, 7-24-90, Cl. D14-114.000.
Hawkins, Junior F. Motorized carrying cart. 309,517, 7-24-90, Cl. D34-17.000.
Heeren, Paul C.: *See*—
Hafvenstein, Philip A.; and Heeren, Paul C., 309,392, Cl. D6-601.000.
Hobbs, Richard E.: *See*—
Bowman, Jerald A.; and Hobbs, Richard E., 309,499, Cl. D24-26.000.
Hockenberry, Jack K., to Wenger Corporation. Storage shelf. 309,389, 7-24-90, Cl. D6-511.000.
Hornsby, Howard C., Jr.; and Murphy, Robert J. Water vehicle. 309,445, 7-24-90, Cl. D12-307.000.
Hvasta, Vi: *See*—
Rome, Max W., 309,489, Cl. D21-217.000.
Inoue, Shinsuke: *See*—
Nagai, Terushige; and Inoue, Shinsuke, 309,370, Cl. D2-320.000.
International Business Machines Corp.: *See*—
Aderman, Wayne L.; Jordan, Willis Y.; Rodd, Timothy J.; and Tennant, Robert P., 309,448, Cl. D14-109.000.
Issler, James E., to H. H. Brown Shoe Company, Inc. Shoe sole. 309,369, 7-24-90, Cl. D2-320.000.
Jenkins, David C.: *See*—
Muller-Deisig, Wolfgang; Jenkins, David C.; West, Terry D.; and Chu, Zooey C., 309,383, Cl. D6-366.000.
Johnson, Gary S.; and Green, Thomas J., to Briggs & Stratton Corporation. Internal combustion engine. 309,458, 7-24-90, Cl. D15-1.000.
Jordan, Willis Y.: *See*—
Aderman, Wayne L.; Jordan, Willis Y.; Rodd, Timothy J.; and Tennant, Robert P., 309,448, Cl. D14-109.000.
Joss, Michael S.: *See*—
Yuan, Arthur H.; and Joss, Michael S., 309,500, Cl. D24-51.000.
Journey, George E. Earth moving outrigger shoe for frost, rocks or the like. 309,459, 7-24-90, Cl. D15-28.000.
Kabushiki Kaisha Beetland: *See*—
Murai, Seishiro, 309,474, Cl. D19-75.000.
Kabushiki Kaisha Toshiba: *See*—
Nishida, Yoshiaki, 309,472, Cl. D18-99.000.
Kay, Robert: *See*—
Rome, Max W., 309,489, Cl. D21-217.000.
Kayano, Toshikazu, to Asics Corporation. Shoe sole. 309,371, 7-24-90, Cl. D2-320.000.
Kearnes, Thom, to State Chemical Manufacturing Company, The. Cabinet air-freshener. 309,497, 7-24-90, Cl. D23-366.000.
Keene, Wallace C. Taco holder. 309,365, 7-24-90, Cl. D7-504.000.
Kennedy, Melvin R.: *See*—
Arad, Avi; and Kennedy, Melvin R., 309,484, Cl. D21-191.000.
Kiernan, Vincent J., to Bares Group. Pair of tool handles. 309,409, 7-24-90, Cl. D8-4.000.
Kiesz, Larry J. Brush for removing lint. 309,376, 7-24-90, Cl. D4-128.000.
Kiesz, Larry J. Brush for removing lint. 309,378, 7-24-90, Cl. D4-128.000.
King, Robert O.; and Collins, Glenn E., to Today's Child, Inc. Pillowcase. 309,391, 7-24-90, Cl. D6-601.000.
Kinugawa Pacific Co., Ltd.: *See*—
Sugita, Taizo, 309,508, Cl. D29-9.000.
Kirschner, Jonathan: *See*—
Thompson, George L.; Smazik, Kenneth G.; and Kirschner, Jonathan, 309,395, Cl. D7-311.000.
Klok, Jan, to U.S. Philips Corporation. Electric iron. 309,516, 7-24-90, Cl. D32-70.000.
Kraai, Duke: *See*—
Charet, Pierre; and Kraai, Duke, 309,444, Cl. D12-203.000.
Langert, H. Edward. Golf club head. 309,488, 7-24-90, Cl. D21-214.000.
Leva, Theresa M. Doll. 309,483, 7-24-90, Cl. D21-166.000.
Lieberman, James L. Portable water filter. 309,487, 7-24-90, Cl. D23-209.000.
Lightfoot, Charles R. Gun and handcuff holster. 309,374, 7-24-90, Cl. D3-101.000.
Little Tikes Company, The: *See*—
Fish, Thomas E., Jr., 309,481, Cl. D21-108.000.
Lockyer, Wallace E., Jr. Birdhouse. 309,513, 7-24-90, Cl. D30-110.000.
Lombardi, Marie. Cup with spoon holder. 309,401, 7-24-90, Cl. D7-507.000.
Lucas, Michael P.: *See*—
Concepcion, Juan F.; Lucas, Michael P.; Tabor, Robert; and Gerstman, Richard B., 309,366, Cl. D1-106.000.
Lund, Lyle B., to Harper-Wyman Company. Cap for a gas burner. 309,398, 7-24-90, Cl. D7-407.000.
Lundblade, Gene; and Deines, Robert, to Coleman Outdoor Products, Inc. Cooler. 309,396, 7-24-90, Cl. D7-313.000.
M. Kamenstein, Inc.: *See*—
Ancona, Jane; and Ancona, Bruce, 309,412, Cl. D8-48.000.
Ancona, Jane; and Ancona, Bruce, 309,413, Cl. D8-57.000.

MacDonald, Lindsay W.; Buxton, Robert G.; and Grayson, Peter, to Crosfield Electronics Limited. Cursor control for a digitizing table. 309,449, 7-24-90, Cl. D14-114.000.
Mancini, Derek V., to Twinpak, Inc. Container. 309,432, 7-24-90, Cl. D9-424.000.
Marcus, Kathleen M.; and Shubin, Steven A. Car seat for small dogs. 309,514, 7-24-90, Cl. D30-118.000.
Marlboro Marketing, Inc.: *See*—
Morrow, Lester, 309,402, Cl. D7-589.000.
Marshall, Donald F. Child's bed. 309,387, 7-24-90, Cl. D6-394.000.
Martin, Lawrence R. Life preserver. 309,491, 7-24-90, Cl. D21-238.000.
Mast, William R. Helmet. 309,509, 7-24-90, Cl. D29-12.000.
Matoba, Keiko, to Sharp Corporation. Hair drier. 309,510, 7-24-90, Cl. D28-16.000.
Matsumoto, Kuniyasu, to Sharp Corporation. Typewriter. 309,469, 7-24-90, Cl. D18-2.000.
May, Joyce R. Combined chopping block with knives, storage, and locking system. 309,407, 7-24-90, Cl. D7-638.000.
McDannel, Richard A.; and Dudick, George M., to Efco, Inc. Forging press. 309,463, 7-24-90, Cl. D15-123.000.
MicroComputer Accessories, Inc.: *See*—
Hassel, H. Charles; Geist, Kenneth; and Du Vall, Gregory, 309,450, Cl. D14-114.000.
Miller, George E.; Brunner, Robert D.; and Wood, Kenneth D., to Carolina Pacific, Inc. Collapsible hand-held periscope. 309,467, 7-24-90, Cl. D16-132.000.
Minamitani, Masaaki, to Ohtsu Tire and Rubber Co., Ltd., The. Vehicle tire. 309,443, 7-24-90, Cl. D12-151.000.
MinnFac, Inc.: *See*—
Hanson, Mark L., 309,504, Cl. D26-68.000.
Minuti, Furio, to Fratelli Guzzini, S.p.A. Container for plates. 309,433, 7-24-90, Cl. D9-424.000.
Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See*—
Yamada, Shinjiro, 309,417, Cl. D8-345.000.
Mitsui, Shigeyuki, to Asics Corporation. Shoe sole. 309,368, 7-24-90, Cl. D2-317.000.
Monroe Systems for Business, Inc.: *See*—
Perelli, Thomas; and Sereika, Joseph C., 309,471, Cl. D18-11.000.
Mori, Tatsuo, to Sharp Corporation. Combined tape recorder and radio. 309,453, 7-24-90, Cl. D14-163.000.
Mori, Tatsuo, to Sharp Corporation. Combined tape recorder and radio. 309,454, 7-24-90, Cl. D14-163.000.
Morris, Suzanne P. Thermalized children's car seat cushion. 309,394, 7-24-90, Cl. D6-611.000.
Morrow, Lester, to Marlboro Marketing, Inc. Bean dispenser. 309,402, 7-24-90, Cl. D7-589.000.
Motorola, Inc.: *See*—
Nagele, Albert L., 309,451, Cl. D14-137.000.
Muller-Deisig, Wolfgang; Jenkins, David C.; West, Terry D.; and Chu, Zooey C., to Steelcase, Inc. Chair seat. 309,383, 7-24-90, Cl. D6-366.000.
Murai, Seishiro, to Kabushiki Kaisha Beetland. Combined plural desk article unit and holder therefor. 309,474, 7-24-90, Cl. D19-75.000.
Murphy, Robert J.: *See*—
Hornsby, Howard C., Jr.; and Murphy, Robert J., 309,445, Cl. D12-307.000.
Nabisco Brands, Inc.: *See*—
Concepcion, Juan F.; Lucas, Michael P.; Tabor, Robert; and Gerstman, Richard B., 309,366, Cl. D1-106.000.
Nagai, Terushige; and Inoue, Shinsuke, to Asics Corporation. Shoe sole. 309,370, 7-24-90, Cl. D2-320.000.
Nagele, Albert L., to Motorola, Inc. Portable radiotelephone or similar article. 309,451, 7-24-90, Cl. D14-137.000.
Ng, Kam W., to Silcon Electronics Company Limited. Combined clock and flashlight. 309,437, 7-24-90, Cl. D10-5.000.
Nishida, Yoshiaki, to Kabushiki Kaisha Toshiba. Mail rearranging/-stamping machine. 309,472, 7-24-90, Cl. D18-99.000.
Nybo, Gregg A.: *See*—
Guenette, Lauren D.; and Nybo, Gregg A., 309,486, Cl. D21-200.000.
Ohtsu Tire and Rubber Co., Ltd., The: *See*—
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Okada, Kenichi, 309,442, Cl. D12-147.000.
Okada, Kenichi, to Ohtsu Tire & Rubber Co., Ltd., The. Vehicle tire. 309,442, 7-24-90, Cl. D12-147.000.
Olin Corporation: *See*—
Casberg, John M., 309,493, Cl. D23-208.000.
Olney, Donald, to Brimms Inc. Combined spinning toy and package. 309,480, 7-24-90, Cl. D21-92.000.
Perelli, Thomas; and Sereika, Joseph C., to Monroe Systems for Business, Inc. Calculator case. 309,471, 7-24-90, Cl. D18-11.000.
Pierotti, John W., to Chef Specialities Company, Inc. Combined pepper mill and salt shaker. 309,403, 7-24-90, Cl. D7-594.000.
Pierotti, John W., to Chef Specialities Company, Inc. Combined pepper mill and salt shaker. 309,404, 7-24-90, Cl. D7-594.000.
Pierotti, John W., to Chef Specialities Company, Inc. Combined pepper mill and salt shaker. 309,405, 7-24-90, Cl. D7-594.000.
PVC (Canada), Ltd.: *See*—
Sharman, Kenneth T.; and Dawson, Bruce H., 309,435, Cl. D9-435.000.
Ramsey, Roger H.; and Wilgus, Mitchell L., to Stanadyne, Inc. Combined hand shower and support. 309,495, 7-24-90, Cl. D23-223.000.
Ramsey, Roger H.; and Wilgus, Mitchell L., to Stanadyne, Inc. Combined shower head escutcheon. 309,496, 7-24-90, Cl. D23-230.000.
Remler, John P. Stackable modular trays. 309,519, 7-24-90, Cl. D34-46.000.
Ridings, Lee J. Off road vehicle ice chest. 309,406, 7-24-90, Cl. D7-605.000.
Riley, William S., to Silent Sentry, Inc. Water filter housing. 309,494, 7-24-90, Cl. D23-209.000.
Robinson, Lenonda M. Mobile storage unit for clothes and laundering aids. 309,515, 7-24-90, Cl. D32-35.000.
Rodd, Timothy J.: *See*—
Aderman, Wayne L.; Jordan, Willis Y.; Rodd, Timothy J.; and Tennant, Robert P., 309,448, Cl. D14-109.000.
Rome, Max W., to Kay, Robert; Hvasta, Vi; and Rome, Max W. Golf club head. 309,489, 7-24-90, Cl. D21-217.000.
Rosalco, Inc.: *See* –
Yau Kee, Peter M., 309,388, Cl. D6-397.000.
Russell, Algernon P. Portable refrigerated beverage dispenser. 309,462, 7-24-90, Cl. D15-90.000.
Russell, John P. Eye shield. 309,465, 7-24-90, Cl. D16-107.000.
Russell, Walter M., to Square D Company. Mini programmable logic controller. 309,446, 7-24-90, Cl. D13-162.000.
S. C. Johnson & Son, Inc.: *See*—
Cramer, Ronald G., 309,430, Cl. D9-415.000.
Saimen, Tadahiko: *See*—
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Sakaguchi, Hiroshi; and Saimen, Tadahiko, to Sharp Corporation. Electronic calculator with printer. 309,470, 7-24-90, Cl. D18-7.000.
Sakuno, Hiroaki, to Sumitomo Rubber Industries, Ltd. Automobile tire. 309,441, 7-24-90, Cl. D12-147.000.
Salehzadeh, Dana L.: *See*—
Salehzadeh, Nasser; and Salehzadeh, Dana L., 309,475, Cl. D21-62.000.
Salehzadeh, Nasser; and Salehzadeh, Dana L. Colliding ball toy. 309,475, 7-24-90, Cl. D21-62.000.
Salomonsson, Krister. Telescopic blade guide. 309,464, 7-24-90, Cl. D15-133.000.
Salvemini, Gianfranco: *See*—
Arduini, Giovanni; Bonfanti, Lorenzo; and Salvemini, Gianfranco, 309,440, Cl. D10-120.000.
Saurer, Hans, to Christian Dior, S.A. Wristwatch. 309,438, 7-24-90, Cl. D10-39.000.
Sereika, Joseph C.: *See*—
Perelli, Thomas; and Sereika, Joseph C., 309,471, Cl. D18-11.000.
Shafir, Grace C. Free standing tweezer. 309,507, 7-24-90, Cl. D28-55.000.
Sharman, Kenneth T.; and Dawson, Bruce H., to PVC (Canada), Ltd.; and CCL Industries, Inc. Cap for an aerosol container. 309,435, 7-24-90, Cl. D9-435.000.
Sharp Corporation: *See*—
Fuke, Mitsutaka, 309,452, Cl. D14-163.000.
Matoba, Keiko, 309,510, Cl. D28-16.000.
Matsumoto, Kuniyasu, 309,469, Cl. D18-2.000.
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Mori, Tatsuo, 309,454, Cl. D14-163.000.
Sakaguchi, Hiroshi; and Saimen, Tadahiko, 309,470, Cl. D18-7.000.
Sheehan, Timothy K., to Amoco Corporation. Candy box and the like. 309,431, 7-24-90, Cl. D9-424.000.
Shimizu, Kiyoshi. Knife sharpener. 309,414, 7-24-90, Cl. D8-93.000.
Shimizu, Kiyoshi. Knife sharpener. 309,415, 7-24-90, Cl. D8-93.000.
Shubin, Steven A.: *See*—
Marcus, Kathleen M.; and Shubin, Steven A., 309,514, Cl. D30-118.000.
Shurkus, Daniel, to Glaxo Inc. Tablet. 309,506, 7-24-90, Cl. D28-2.000.
Silcon Electronics Company Limited: *See*—
Ng, Kam W., 309,437, Cl. D10-5.000.
Silent Sentry, Inc.: *See*—
Riley, William S., 309,494, Cl. D23-209.000.
Smazik, Kenneth G.: *See*—
Thompson, George L.; Smazik, Kenneth G.; and Kirschner, Jonathan, 309,395, Cl. D7-311.000.
Smith, Henry L. Hanging display shelf. 309,390, 7-24-90, Cl. D6-571.000.
Spalding & Evenflo Companies, Inc.: *See*—
Yuan, Arthur H.; and Joss, Michael S., 309,500, Cl. D24-51.000.
Square D Company: *See*—
Russell, Walter M., 309,446, Cl. D13-162.000.
Staley, Darrell S., to Ampex Corporation. Video switcher. 309,455, 7-24-90, Cl. D14-239.000.
Stanadyne, Inc.: *See*—
Ramsey, Roger H.; and Wilgus, Mitchell L., 309,495, Cl. D23-223.000.
Ramsey, Roger H.; and Wilgus, Mitchell L., 309,496, Cl. D23-230.000.
State Chemical Manufacturing Company, The: *See*—
Kearnes, Thom, 309,497, Cl. D23-366.000.
Steelcase, Inc.: *See*—
Muller-Deisig, Wolfgang; Jenkins, David C.; West, Terry D.; and Chu, Zooey C., 309,383, Cl. D6-366.000.
Sternbach, Richard M. Toy hypodermic sprayer. 309,482, 7-24-90, Cl. D21-109.000.
Strand, Everett D. Pizza griddle. 309,397, 7-24-90, Cl. D7-354.000.
Strock, Bruce L. Open-ended wrench. 309,411, 7-24-90, Cl. D8-17.000.
Sugita, Taizo, to Kinugawa Pacific Co., Ltd. Diving mask. 309,508, 7-24-90, Cl. D29-9.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Sakuno, Hiroaki, 309,441, Cl. D12-147.000.
Tabor, Robert: *See*—
Concepcion, Juan F.; Lucas, Michael P.; Tabor, Robert; and Gerstman, Richard B., 309,366, Cl. D1-106.000.

Talaugon, Margie C. Car seat pillow. 309,393, 7-24-90, Cl. D6-601.000.
Taylor, Carl J.; and Whaley, Robert L., to Bardes Corporation. Hand held flexible brush for cleaning electrical terminals of varying size. 309,377, 7-24-90, Cl. D4-130.000.
Tennant, Robert P.: *See*—
Aderman, Wayne L.; Jordan, Willis Y.; Rodd, Timothy J.; and Tennant, Robert P., 309,448, Cl. D14-109.000.
Thompson, George L.; Smazik, Kenneth G.; and Kirschner, Jonathan, to Coca-Cola Company, The. Juice dispenser. 309,395, 7-24-90, Cl. D7-311.000.
Tiger Electronics, Inc.: *See*—
Arad, Avi; and Kennedy, Melvin R., 309,484, Cl. D21-191.000.
Today's Child, Inc.: *See*—
King, Robert O.; and Collins, Glenn E., 309,391, Cl. D6-601.000.
Toly Products (UK) Limited: *See*—
Bertlin, Bryan; Enskat, Colin J.; and Breese, Reginald W., 309,511, Cl. D28-78.000.
'totes', incorporated: *See*—
Cain, Ann S., 309,372, Cl. D3-12.000.
Toy, Sylvia S. Bookmark. 309,473, 7-24-90, Cl. D19-34.000.
Turner, Kaylene Gail: *See*—
Dawes, Robert, 309,379, Cl. D4-138.000.
Turner, Trevor John: *See*—
Dawes, Robert, 309,379, Cl. D4-138.000.
Twinpak, Inc.: *See*—
Mancini, Derek V., 309,432, Cl. D9-424.000.
U.S. Philips Corporation: *See*—
Klok, Jan, 309,516, Cl. D32-70.000.
Viklund, Ake E., to Electrolux Constructor Aktiebolag. Storage box. 309,518, 7-24-90, Cl. D34-40.000.
Vita-Mix Corporation: *See*—
Barnard, John K.; and Brown, David A., 309,399, Cl. D7-412.000.
Barnard, John K., 309,400, Cl. D7-412.000.
Vitarine Pharmaceuticals, Inc.: *See*—
Colton, Steven F., 309,505, Cl. D28-2.000.
Wenger Corporation: *See*—
Hockenberry, Jack K., 309,389, Cl. D6-511.000.
Weslo, Inc.: *See*—
Bingham, Curt G.; and Dalebout, William T., 309,485, Cl. D21-194.000.
West, Terry D.: *See*—
Muller-Deisig, Wolfgang; Jenkins, David C.; West, Terry D.; and Chu, Zooey C., 309,383, Cl. D6-366.000.
Westcan Electrical Manufacturing Inc.: *See*—
Bandari, Ardeshir, 309,447, Cl. D13-158.000.
Whaley, Robert L.: *See*—
Taylor, Carl J.; and Whaley, Robert L., 309,377, Cl. D4-130.000.
Whirlpool Corporation: *See*—
Bussan, Marc R.; Fellwock, Charles G.; and DeBoer, Jeffrey A., 309,461, Cl. D15-89.000.
Wilgus, Mitchell L.: *See*—
Ramsey, Roger H.; and Wilgus, Mitchell L., 309,495, Cl. D23-223.000.
Ramsey, Roger H.; and Wilgus, Mitchell L., 309,496, Cl. D23-230.000.
Wilson, Patricia G. Stick pony toy. 309,501, 7-24-90, Cl. D21-75.000.
Wing Enterprises, Inc.: *See*—
Wing, Harold R.; and Cluff, Kenneth C., 309,502, Cl. D25-68.000.
Wing, Harold R.; and Cluff, Kenneth C., to Wing Enterprises, Inc. Hinge for ladders and the like. 309,502, 7-24-90, Cl. D25-68.000.
Wodli, Marc, to Electroli, S.A. Table saw. 309,466, 7-24-90, Cl. D15-133.000.
Wood, Kenneth D.: *See*—
Miller, George E.; Brunner, Robert D.; and Wood, Kenneth D., 309,467, Cl. D16-132.000.
Yamada, Shinjiro, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Striker plate for an automobile door lock. 309,417, 7-24-90, Cl. D8-345.000.
Yau Kee, Peter M., to Rosalco, Inc. Vanity table. 309,388, 7-24-90, Cl. D6-397.000.
Yuan, Arthur H.; and Joss, Michael S., to Spalding & Evenflo Companies, Inc. Breast pump. 309,500, 7-24-90, Cl. D24-51.000.
Zeisel, Hans K. Combined clock and bank. 309,436, 7-24-90, Cl. D10-2.000.
Zitting, Brent W. Bunk bed. 309,422, 7-24-90, Cl. D6-390.000.

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Conard-Pyle Company, The: *See*—
Meilland, Alain A., 7,276, Cl. 8.000.
Meilland, Marie-Louise, 7,278, Cl. 14.000.
Meilland, Marie-Louise, deceased, 7,277, Cl. 9.000.

Hetherington, Ernest, to Stewart Orchids. Blc. Mem. Ralph Placentia C.V. Toreador. 7,280, 7-24-90, Cl. 68.000.

le Nacur, Jean-Pierre, legal representative: *See*—
Meilland, Marie-Louise, deceased, 7,277, Cl. 9.000.

Meilland, Alain A., to Conard-Pyle Company, The. Rose plant — Meizogrel variety. 7,276, 7-24-90, Cl. 8.000.

Meilland, Marie-Louise, to Conard-Pyle Company, The. Rose plant — Meimafris variety. 7,278, 7-24-90, Cl. 14.000.

Meilland, Marie-Louise, deceased (by le Naour, Jean-Pierre, legal representative), to Conard-Pyle Company, The. Rose plant-Meitonje variety. 7,277, 7-24-90, Cl. 9.000.

New Plants: *See*—
Zampini, James W., 7,279, Cl. 51.000.

Segers, Th. A., to Twyford Plant Laboratories, Inc. Sardis. 7,281, 7-24-90, Cl. 68.000.

Stewart Orchids: *See*—
Hetherington, Ernest, 7,280, Cl. 68.000.

Twyford Plant Laboratories, Inc.: *See*—
Segers, Th. A., 7,281, Cl. 68.000.

Zampini, James W., to New Plants. Seedless hybrid maple tree named Celzam. 7,279, 7-24-90, Cl. 51.000.

CLASSIFICATION OF PATENTS

ISSUED JULY 24, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

16 4,942,624
73 4,942,625
161 R 4,942,626
207 4,942,627
416 4,942,628
435 4,942,629

CLASS 4

542 4,942,630
623 4,942,631
661 4,942,632

CLASS 5

11 4,942,633
450 4,942,634
453 4,942,635
475 4,942,636

CLASS 7

135 4,942,637

CLASS 8

610 4,943,299

CLASS 15

50 R 4,942,638
83 4,942,639
319 4,942,640
338 4,942,641

CLASS 17

46 4,942,642

CLASS 19

44 4,942,643
66 R 4,943,300

CLASS 23

313 R 4,943,301

CLASS 24

16 PB 4,942,644
33 C 4,942,645
40 4,942,646
170 4,942,647
389 4,942,648
637 4,942,649

CLASS 29

38 B 4,942,650
91.5 4,942,651
229 4,942,655
527.6 4,942,656
568 4,942,657
603 4,942,658
701 4,942,660
705 4,942,659
723 4,942,661
890.01 4,942,653
890.035 4,942,654
898.067 4,942,652

CLASS 30

49 4,942,662
151 4,942,663
276 4,942,664
4,942,665

CLASS 33

203.18 4,942,666
288 4,942,667
366 4,942,668
494 4,942,670
559 4,942,671
725 4,942,669
832 4,942,672

CLASS 34

10 4,942,673
18 4,942,674
23 4,942,675
51 4,942,676

CLASS 36

27 4,942,677
102 4,942,678
4,942,679
119 4,942,680
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CLASS 37

66 4,942,682

CLASS 38

102.91 4,942,683

CLASS 40

152 4,942,684
152.2 4,942,685
610 4,942,686

CLASS 43

17 4,942,687
27.2 4,942,688
42.12 4,942,690
42.24 4,942,689
54.1 4,942,691

CLASS 44

56 4,943,302
57 4,943,303
228 4,943,306

CLASS 47

41.12 4,942,692
44 4,942,693

CLASS 49

192 4,942,694

CLASS 51

165 R 4,942,695
277 4,942,696
283 R 4,942,697

CLASS 52

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127.7 4,942,702
167 R 4,942,703
171 4,942,704
202 4,942,705
234 4,942,706
259 4,942,707
263 4,942,708
285 4,942,709
396 4,942,710
397 4,942,711
506 4,942,712
584 4,942,713
687 4,942,714

CLASS 53

202 4,942,715
426 4,942,716
428 4,942,717
435 4,942,718
436 4,942,719
447 4,942,720

CLASS 54

46 4,942,721

CLASS 55

66 4,943,304
170 4,943,305
500 Re.33,272

CLASS 56

8 4,942,722
10.4 4,942,724
10.6 4,942,723
16.9 4,942,725
17.2 4,942,726
126 4,942,727
296 4,942,728

CLASS 57

261 4,942,729
303 4,942,730
328 4,942,731

CLASS 60

39.02 4,942,734
261 4,942,732
267 4,942,733
416 4,942,735
431 4,942,737
550 4,942,738
641.12 4,942,736

CLASS 62

93 4,942,739
4,942,740
292 4,942,741
347 4,942,742
503 4,942,743

CLASS 63

26 4,942,744

CLASS 70

58 4,942,745
238 4,942,746
263 4,942,747
389 4,942,748
495 4,942,749

CLASS 71

3 4,943,307
29 4,943,308
74 4,943,309
88 4,943,310
90 4,943,311
4,943,312
94 4,943,314
120 4,943,315

CLASS 72

56 4,942,750
68 4,942,751
70 4,942,752
178 4,942,753
247 4,942,754
254 4,942,755
399 4,942,756
453.16 4,942,757

CLASS 73

49.2 4,942,758
56 4,942,759
64.4 4,942,760
82.1 4,942,769
117 4,942,762
119 R 4,942,761
202.5 4,942,763
301 4,942,764
431 4,942,765
704 4,942,766
705 4,942,767
795 4,942,768
862.36 4,942,771
863.83 4,942,772
864.34 4,942,770
864.45 4,942,773
864.81 4,942,774
865.3 4,942,775

CLASS 74

61 4,942,776
397 4,942,777
594.6 4,942,778
866 4,942,782
4,942,783
4,942,784
867 4,942,785
4,942,786
4,942,787

CLASS 75

0.5 A 4,943,316
229 4,943,319
235 4,943,320
243 4,943,321
312 4,943,317

CLASS 76

115 4,942,788

CLASS 81

9.51 4,942,789
53.2 4,942,792
54 4,942,793
57.22 4,942,794
133 4,942,790
177.1 4,942,791

CLASS 83

72 4,942,795
4,942,796
76.9 4,942,797
124 B1 4,267,753
636 4,942,798

CLASS 84

603 4,942,799

CLASS 86

20.1 4,942,800

CLASS 89

14.3 4,942,801
191.01 4,942,802

CLASS 91

370 4,942,803

CLASS 92

212 4,942,804

CLASS 98

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2.02 4,942,806

CLASS 99

348 4,942,807
404 4,942,808
426 4,942,809
477 4,942,810
495 4,942,811

CLASS 100

214 4,942,812

CLASS 101

152 4,942,813
232 4,942,814
352 4,942,815

CLASS 102

235 4,942,816
331 4,942,817
444 4,942,818
476 4,942,819
482 4,942,820

CLASS 104

12 4,942,821
16 4,942,822
178 4,942,823

CLASS 105

4.3 4,942,824
18 4,942,825
178 4,942,826

CLASS 106

486 4,943,324
808 4,943,323

CLASS 108

44 4,942,827
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79 4,942,829
111 4,942,830

CLASS 109

29 4,942,831

CLASS 110

190 4,942,832

CLASS 111

121 4,942,833

CLASS 112

199 4,942,834
302 4,942,835
445 4,942,836

CLASS 114

40 4,942,837
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363 4,942,840

CLASS 116

317 4,942,841

CLASS 118

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723 4,942,844

CLASS 119

52.2 4,942,845
103 4,942,846

CLASS 122

35 4,942,847

CLASS 123

1 A 4,942,848
41.1 4,942,849
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90.14 4,942,852
90.16 4,942,853
90.17 4,942,854
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146.5 A 4,942,856
193 H 4,942,857
4,942,858
198 D 4,942,859
447 Re.33,270
571 4,942,860

CLASS 124

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CLASS 126

110 E 4,942,863
214 D 4,942,864
337 R 4,942,862
431 4,942,865

CLASS 128

4 4,942,866
6 4,942,867
24 A 4,942,868
43 4,942,869
66 4,942,870
4,942,871
203.11 4,942,873
203.16 4,942,874
419 P 4,942,876
633 4,942,877
660.03 4,942,878
684 4,942,879
734 4,942,880
763 4,942,881
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804 4,942,884
842 4,942,885
885 4,942,886

CLASS 131

336 4,942,887
359 4,942,888
365 4,942,889

CLASS 132

212 4,942,890
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CLASS 135

99 4,942,895

CLASS 136

259 4,943,325

CLASS 137

360 4,942,896
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454.5 4,942,899
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625.17 4,942,902

CLASS 138

89 4,942,904
110 4,942,903
118 4,942,905
126 4,942,906
157 4,942,907

CLASS 139

99 4,942,908
370.2 4,942,909

CLASS 141

9 4,942,910
359 4,942,911

CLASS 144

136 C 4,942,912

CLASS 148

11.5 N 4,943,326

CLASS 150

138 4,942,913

CLASS 152

531 4,942,914

CLASS 156

62.6 4,943,327
64 4,943,328
88 4,943,329
89 4,943,330
129 4,943,331
146 4,943,332
153 4,943,333
174 4,943,334
244.18 4,943,335
280 4,943,336
384 4,943,337
433 4,943,338
443 4,943,339
496 4,943,340
517 4,943,341
584 4,943,342
643 4,943,343
4,943,344
4,943,345
651 4,943,346

CLASS 162

61 4,943,347
158 4,943,349
4,943,350
205 4,943,351

CLASS 164

34 4,942,915
186 4,942,916
369 4,942,917
420 4,942,919
463 4,942,918

CLASS 165

1 4,942,920
16 4,942,921
134.1 4,942,922

CLASS 166

250 4,942,923
290 4,942,924
382 4,942,925
385 4,942,926

CLASS 171

58 4,942,927

CLASS 172

219 4,942,928

CLASS 174

19 4,943,685
52 F 4,943,686
94 R 4,943,687
103 4,943,688

CLASS 175

66 4,942,929
228 4,942,930
323 4,942,931
4,942,932
329 4,942,933

CLASS 178

18 4,943,689

CLASS 180

6.48 4,942,934
133 4,942,935
207 4,942,936
271 4,942,937

CLASS 181

30 4,942,938
156 4,942,939

CLASS 182

82 4,942,940
136 4,942,941
187 4,942,942
231 4,942,943

CLASS 184

27.1 4,942,944

CLASS 188

202 4,942,945
210 4,942,946
267 4,942,947

CLASS 190

8 4,942,948

CLASS 192

0.096 4,942,950
1.32 4,942,949
58 C 4,942,951
105 CD 4,942,952

CLASS 193

25 C 4,942,953

CLASS 194

351 4,942,954

CLASS 196

46.1 4,943,352

CLASS 198

465.3 4,942,956
471.1 4,942,955
781 4,942,957
833 4,942,958

CLASS 200

61.47 4,943,690
151 4,943,691
283 4,943,692
304 4,943,693
332.1 4,943,694
345 4,943,695
407 4,943,696

CLASS 202

181 4,943,353

CLASS 203

14 4,943,354

CLASS 204

20 4,943,355
111 B1 4,637,865
157.15 4,943,357
157.3 4,943,356
157.93 4,943,358
181.6 4,943,359
182.3 4,943,360
192.32 4,943,361
298.13 4,943,362
298.15 4,943,363
415 4,943,364

CLASS 206

5.1 4,942,959
205 4,942,960
254 4,942,961
315.7 4,942,962
333 4,942,963
334 4,942,964
419 4,942,965
521 4,942,966

CLASS 208

44 4,943,365
68 4,943,366
131 4,943,367

CLASS 209

2 4,943,368
583 4,943,369

CLASS 210

85 4,943,370
101 4,943,371
164 4,943,100
324 4,943,372
500.42 4,943,373
639 Re.33,273
651 4,943,374
674 4,943,375
4,943,376
709 4,943,377
734 4,943,378
778 4,943,379

CLASS 211

74 4,942,967
184 4,942,968

CLASS 215

100 R 4,942,969
358 4,942,970

CLASS 219

10.55 B 4,943,697
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124.34 4,943,702
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385 4,943,705
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532 B1 4,692,599

CLASS 220

1.5 4,942,971
3 4,942,972
23.4 4,942,975
201 4,942,973
214 4,942,974
254 4,942,976
276 4,942,977
470 4,942,978

CLASS 221

75 4,942,979
244 4,942,980

CLASS 222

94 4,942,981
195 4,942,982
238 4,942,983
309 4,942,984
376 4,942,985
590 4,942,986

CLASS 223

37 4,942,987
111 4,942,988

CLASS 224

42.42 4,942,990
42.45 R 4,942,989
196 4,942,991
240 4,942,992
247 4,942,994
258 4,942,995
275 4,942,993

CLASS 227

136 4,942,996

CLASS 228

56.1 4,942,997
102 4,942,998
124 4,942,999
173.4 4,943,001
193 4,943,000

CLASS 232

43.1 4,943,002

CLASS 235

380 4,943,707
492 4,943,708

CLASS 237

2 B 4,943,003

CLASS 238

349 4,943,006

CLASS 239

95 4,943,004
223 4,943,005
405 4,943,007
754 4,943,008

CLASS 242

42 4,943,009
107 4,943,011
107.4 A 4,945 010
290 4,945,012

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54 4,943,013
158 R 4,943,014
161 4,943,015

CLASS 248

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102 4,943,017
110 4,943,018
123.1 4,943,019
124 4,943,020
167 4,943,021
205.1 4,943,022
302 4,943,023
316.7 4,943,024
318 4,943,025
339 4,943,026
548 4,943,027
4,943,028
917 4,943,029

CLASS 249

121 4,943,030

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201.9 4,943,709
208.1 4,943,710
213 VT 4,943,711
221 4,943,712
223 B 4,943,713
227.16 4,943,714
229 4,943,715
231.16 4,943,716
231.17 4,943,717
288 4,943,718
305 Re.33,275
306 4,943,719
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308 4,943,721
310 4,943,722
327.2 4,943,723
4,943,724
4,943,725
363.02 4,943,726
483.1 4,943,727
484.1 4,944,026
492.3 4,943,728
4,943,729
4,943,730
497.1 4,943,731
548 4,943,733
572 4,943,732
4,943,734
573 4,943,735

CLASS 251

1.3 4,943,031
11 4,943,032
88 4,943,033

CLASS 252

8.7 4,943,380
51.5 A 4,943,382
51.5 R 4,943,381
52 A 4,943,383
69 4,943,388
299.61 4,943,384
4,943,385
299.65 4,943,386
299.67 4,943,387
308 4,943,389
355 4,943,390
401 4,943,391
539 4,943,392
554 4,943,393
628 4,943,394
629 4,943,395

CLASS 254

122 4,943,034

CLASS 256

64 4,943,035

CLASS 260

405.5 4,943,396
4,943,397

CLASS 264

63 4,943,401
82 4,943,398
101 4,943,399
113 4,943,400
141 4,943,402
233 4,943,403
257 4,943,404
322 4,943,405
522 4,943,406
572 4,943,407

CLASS 266

104 4,943,036

CLASS 267

131 4,943,037

CLASS 269

37 4,943,038
45 4,943,039
69 4,943,040
296 4,943,042
322 4,943,041

CLASS 271

212 4,943,043
248 4,943,044
277 4,943,045

CLASS 272

1 R 4,943,046
56.5 R 4,943,048
68 4,943,047
70 4,943,049
4,943,050
72 4,943,051
123 4,943,052
135 4,943,053

CLASS 273

1 R 4,943,054
26 R 4,943,055
30 4,943,056
55 R 4,943,057
73 J 4,943,058
80.1 4,943,059
109 4,943,060
127 R 4,943,061
139 4,943,090
144 B 4,943,062
157 R 4,943,063
384 4,943,064
402 4,943,065
415 4,943,066
416 4,943,067

CLASS 277

23 4,943,068
27 4,943,069
235 R 4,943,070

CLASS 279

43 4,943,071

CLASS 280

47.27 4,943,073
91 4,943,074
112 4,943,072
166 4,943,076
260 4,943,077
408 4,943,078
420 4,943,079
455.1 4,943,080
660 4,943,092
666 4,943,081
673 4,943,082
707 4,943,083
4,943,084
741 4,943,086
770 4,943,085
804 4,943,087
842 4,943,075

CLASS 281

39 4,943,088

CLASS 283

81 4,943,089
83 4,943,093

CLASS 285

12 4,943,091
333 4,943,094
334 4,943,095

CLASS 292

213 4,943,096

CLASS 294

19.1 4,943,097
65.5 4,943,098
82.32 4,943,099

CLASS 295

8.5 4,943,101

CLASS 296

24.2 4,943,105
26 4,943,106
70 4,943,107
96.21 4,943,102
97.1 4,943,103
100 4,943,108
146 4,943,109
181 4,943,110
223 4,943,104

CLASS 297

194 4,943,111
238 4,943,112
250 4,943,113
301 4,943,114
4,943,115
362 4,943,116
392 4,943,117

CLASS 298

12 4,943,118

CLASS 299

1 4,943,119
42 4,943,120

CLASS 301

37 SS 4,943,121
108 A 4,943,122

CLASS 303

111 4,943,123

CLASS 307

261 4,943,736
296.7 4,943,737
362 4,943,738
443 4,943,739
454 4,943,740
455 4,943,741
458 4,943,742
475 4,943,743
480 4,943,744
603 4,943,745

CLASS 310

61 4,943,746
67 R 4,943,747
4,943,748
260 4,943,749
309 4,943,750
313 D 4,943,751
339 4,943,752

CLASS 312

222 4,943,124

CLASS 313

440 4,943,753
477 R 4,943,754

CLASS 315

8 4,943,755

CLASS 318

468 4,943,757
504 4,943,758
568.11 4,943,759
671 4,943,756
701 4,943,760

CLASS 323

283 4,943,761
284 4,943,762
309 4,943,763

CLASS 324

95 4,943,764
107 4,943,765
132 4,943,766
158 F 4,943,767
4,943,768
158 R 4,943,769
207.12 4,944,028
207.13 4,943,773
207.17 4,943,770
207.18 4,943,771
207.2 4,943,772
318 4,943,774
322 4,943,775
391 4,943,776
433 4,943,777
636 4,943,778

CLASS 328

14 4,943,779
234 4,943,781

CLASS 330

4.3 4,943,782
149 4,943,783
264 4,943,784
277 4,943,785

CLASS 331

1 A 4,943,786
2 4,943,787
11 4,943,788

CLASS 333

18 4,943,789
24.2 4,943,790

CLASS 335

153 4,943,791
216 4,943,792

CLASS 336

83 4,943,793
192 4,943,794

CLASS 338

21 4,943,795

CLASS 340

435 4,943,796
443 4,943,798
450.3 4,943,797
521 4,943,799
567 4,943,800
723 4,943,801
784 4,943,802
825.310 4,943,804
825.490 4,943,803
825.800 4,944,029
933 4,943,805

CLASS 341

31 4,943,806
120 4,943,807

CLASS 342

356 4,943,808

CLASS 343

700 MS 4,943,809
702 4,943,810
725 Re.33,276
814 4,943,811

CLASS 346

1.1 4,943,812
4,943,813
4,943,814
25 4,943,816
108 4,943,815
140 A 4,943,817
140 R 4,943,818
160.1 4,943,819

CLASS 350

3.69 4,943,126
6.8 4,943,127
6.9 4,943,128
96.1 4,943,125
96.12 4,943,129
4,943,130
4,943,131
96.13 4,943,132
4,943,134
96.14 4,943,133
96.16 4,943,136
96.18 4,943,137
96.20 4,943,138
105 4,943,139
164 4,943,140
258 4,943,141
315 4,943,142
339 R 4,943,143
354 4,943,144
4,943,145
471 4,943,146
486 4,943,147
529 4,943,148
568 4,943,149

CLASS 351

49 4,943,152
177 4,943,150
203 4,943,151
235 4,943,162

CLASS 353

25 4,943,153
31 4,943,154
33 4,943,155
66 4,943,156

CLASS 354

82 4,943,820
99 4,943,821
219 4,943,822
322 4,943,823
400 4,943,824
402 Re.33,277
403 4,944,030
481 4,943,825

CLASS 355

27 4,943,826
30 4,943,827
200 4,943,828
206 4,944,031
215 4,943,829
245 4,943,830
271 4,943,863
290 4,943,831
313 4,943,832
326 4,943,833
327 4,943,834

CLASS 356

1 4,943,157
4 4,943,158
73 4,943,159
372 4,943,160
437 4,943,161

CLASS 357

23.13 4,943,835
23.5 4,943,836
23.7 4,943,837
4,943,838
30 4,943,839
39 4,943,840
45 4,943,841
51 4,943,842
70 4,943,843
74 4,943,844
4,943,845
80 4,943,846

CLASS 358

12 4,943,847
4,943,848
4,943,849
4,944,032
55 4,943,850
87 4,943,851
88 4,943,852
4,943,860
102 4,943,853
108 4,943,854
4,943,864
133 4,943,855
141 4,943,856
148 4,943,857
167 4,943,858
172 4,943,859
244 4,943,861
245 4,943,862
335 4,943,865
4,943,866
342 4,943,867
403 4,943,868
426 4,943,869
451 4,943,870
496 4,943,871

CLASS 360

8 4,943,872
77.15 4,943,873
85 4,943,874
90 4,943,878
104 4,943,875
4,943,881

106 4,943,876
4,943,877
126 4,943,879
4,943,882
4,943,883
133 4,943,880

CLASS 361

15 4,943,884
42 4,943,886
56 4,943,887
96 4,943,888
232 4,943,885
284 4,943,889
388 4,943,890
392 4,943,891
525 4,943,892

CLASS 362

37 4,943,893
61 4,943,894
66 4,943,895
84 4,943,896
223 4,943,897
226 4,943,898
4,943,899
227 4,943,900
277 4,943,901

CLASS 363

80 4,943,902
97 4,943,903
144 4,943,904

CLASS 364

136 4,943,905
188 4,943,906
200 4,943,907
4,943,908
4,943,909
4,943,910
4,943,911
4,943,912
4,943,913
4,943,914
4,943,915
4,943,916
420 4,943,917
421 4,943,918
424.03 4,943,919
424.1 4,943,920
4,943,921
426.02 4,943,922
426.04 4,943,923
431.12 4,943,924
449 4,943,925
470 4,943,927
4,944,033
477 4,943,928
486 4,943,926
496 4,943,929
506 4,943,930
513 4,943,931
4,943,932
4,943,933
518 4,943,934
4,943,935
519 4,943,936
521 4,943,937
522 4,943,938
4,944,034
555 4,943,939
556 4,944,035
748 4,943,940
4,943,941
900 4,943,942

CLASS 365

185 4,943,943
189.05 4,943,944
189.09 4,943,945
189.12 4,943,946
4,943,947
201 4,943,948
206 4,943,949
207 4,943,952
222 4,943,960
228 4,943,961
230.08 4,943,962

CLASS 366

106 4,943,163
149 4,943,164
348 4,943,165

CLASS 367

43 4,944,036
50 4,943,950
111 4,943,951
137 4,943,956
139 4,943,953
191 4,943,954

CLASS 368

156 4,943,955

CLASS 369

13 4,944,037
32 4,943,166

CLASS 370

77 4,943,958
85.5 4,943,959
4,944,038
94.1 4,943,963

CLASS 371

2.2 4,943,967
11.1 4,943,966
19 4,943,968
31 4,943,964
36 4,943,965
68.1 4,943,969

CLASS 372

45 4,943,970
46 4,943,971
75 B1 4,653,056
107 4,943,972

CLASS 375

4 4,943,979
42 4,943,980
81 4,943,982
84 4,943,983
109 4,943,984
111 4,943,985

CLASS 376

210 4,943,408
212 4,943,409
245 4,943,683
261 4,943,410

CLASS 377

47 4,943,981

CLASS 378

37 4,943,986
99 4,943,987
108 4,943,988
130 4,943,989
152 4,943,990
182 4,943,991
208 4,943,992

CLASS 379

6 4,943,993
53 4,943,994
67 4,943,995
96 4,943,996
160 4,943,997
220 4,943,998
221 4,943,999
359 4,944,000
386 4,944,001
388 4,944,002
412 4,944,003
4,944,004
449 4,944,005

CLASS 380

20 4,944,006
21 4,944,007
46 4,944,008
4,944,009

CLASS 381

4 4,944,010
15 4,944,011
30 4,944,012
38 4,944,013
51 4,944,014
55 4,944,015
74 4,944,016
79 4,944,017
86 4,944,018
90 4,944,019
96 4,944,020

CLASS 382

5 4,944,021
14 4,944,022
37 4,944,023

CLASS 383

8 4,943,167
38 4,943,168

CLASS 384

43 4,943,169
99 4,943,170
537 4,943,171
565 4,943,172

CLASS 400

689 4,943,173
703 4,943,174

CLASS 401

111 4,943,175
197 4,943,176

CLASS 402

72 4,943,177

CLASS 403

259 4,943,178
269 4,943,179
295 4,943,180
324 4,943,181
349 4,943,182
406.1 4,943,183

CLASS 405

39 4,943,184
45 4,943,185
73 4,943,186
190 4,943,187
224 4,943,188
267 4,943,189

CLASS 406

134 4,943,190

CLASS 408

1 R 4,943,191
226 4,943,192

CLASS 410

69 4,943,193
132 4,943,194

CLASS 411

55 4,943,195
342 4,943,253
361 4,943,196
375 4,943,197

CLASS 414

13 4,943,198
331 4,943,199
332 4,943,200
408 4,943,201
475 4,943,202
486 4,943,203
495 4,943,204
680 4,943,205
786 4,943,206
797.7 4,943,207

CLASS 415

175 4,943,208

CLASS 416

204 R 4,943,209

CLASS 417

7 4,943,212
12 4,943,210
131 4,943,211
310 4,943,213

CLASS 418

9 4,943,214
4,943,215
15 4,943,216
270 4,943,217
552 4,943,487

CLASS 420

417 4,943,322
420 4,943,412
528 4,943,413

CLASS 422

28 4,943,414
56 4,943,415
63 4,943,416
292 4,943,417

CLASS 423

10 4,943,318
50 4,943,418
72 4,943,419
112 4,943,420
235 4,943,421
242 4,943,422
293 4,943,423
328 4,943,424
338 4,943,425
497 4,943,426
566 4,943,611

CLASS 424

1.1 4,943,427
10 4,943,428
52 4,943,429
70 4,943,430
4,943,431
195.1 4,943,433
4,943,434
448 4,943,435
647 4,943,432

CLASS 425

10 4,943,218
64 4,943,219
66 4,943,220
73 4,943,221
89 4,943,222
116 4,943,223
174.8 R 4,943,224
275 4,943,225
326.1 4,943,226
345 4,943,227
526 4,943,228
535 4,943,229

CLASS 426

16 4,943,436
61 4,943,437
92 4,943,438
107 4,943,439
118 4,943,440
511 4,943,441
513 4,943,442
569 4,943,443
573 4,943,444
4,943,445

CLASS 427

9 4,943,446
55 4,943,447
58 4,943,448
154 4,943,680
213.3 4,943,449
255.2 4,943,450
294 4,943,451
299 4,943,452
309 4,943,453

CLASS 428

12 4,943,454
26 4,943,455
34.3 4,943,456
34.4 4,943,684
35.2 4,943,457
35.7 4,943,458
35.9 4,943,780
36.5 4,943,459
36.9 4,943,460
40 4,943,461
42 4,943,462
44 4,943,463
76 4,943,464
102 4,943,465
122 4,943,466
159 4,943,467
209 4,943,469
4,943,470
210 4,943,468
213 B1 4,303,721
220 4,943,471
240 4,943,472
245 4,943,473
246 4,943,474
4,943,475
280 4,943,476
286 4,943,477
288 4,943,478
331 4,943,479
332 4,943,480
373 4,943,481
407 4,943,482
433 4,943,483
441 4,943,484
457 4,943,485
469 4,943,486
552 4,943,488
586 4,943,489
614 4,943,490
620 4,943,491
654 4,943,492
694 4,943,957

CLASS 429

17 4,943,493
30 4,943,494
35 4,943,495
45 4,943,496
53 4,943,497
97 4,943,498
192 4,943,499
207 4,943,500

CLASS 430

58 4,943,501
4,943,502
59 B1 4,481,273
66 4,943,503
102 4,943,504
109 4,943,505
4,943,506
120 4,943,507
129 4,943,508
138 4,943,509
160 4,943,510
192 4,943,511
197 4,943,512
260 4,943,513
270 4,943,514
4,943,515
280 4,943,516
301 4,943,517
378 4,943,518
495 4,943,681
512 4,943,519
527 4,943,520

CLASS 431

183 4,943,230
215 4,943,231
263 4,943,232

CLASS 432

13 4,943,233
152 4,943,234
205 4,943,235

CLASS 433

165 4,943,236
213 4,943,237
222.1 Re.33,271

CLASS 434

224 4,943,238
353 4,943,239

CLASS 435

6 4,943,521
7 4,943,522
4,943,523
4,943,524
4,943,525
15 4,943,526
69.6 4,943,527
158 4,943,528
172.3 4,943,529
188 4,943,530
194 4,943,531
209 4,943,532
240.27 4,943,533
302 4,943,534
311 4,943,535

CLASS 437

28 4,943,536
34 4,943,537
52 4,943,538
174 Re.33,274
195 4,943,539
225 4,943,540

CLASS 439

15 4,943,240
34 4,943,241
65 4,943,242
289 4,943,243
567 4,943,244
578 4,943,245
656 4,943,246
850 4,943,248
883 4,943,247

CLASS 440

28 4,943,251
73 4,943,249
101 4,943,250

CLASS 441

87 4,943,252

CLASS 445

28 4,943,254

CLASS 446

15 4,943,255
278 4,943,256

CLASS 453

9 4,943,257
30 4,943,258

CLASS 455

35 4,944,024
207 4,944,025

CLASS 460

52 4,943,259
96 4,943,260

CLASS 464

76 4,943,261
131 4,943,262
180 4,943,263

CLASS 474

13 4,943,264
25 4,943,265
201 4,943,266

CLASS 475

6 4,943,267
39 4,942,779
83 4,942,780
95 4,943,268
231 4,943,269
342 4,942,781

CLASS 493

10 4,943,270
24 4,943,271
45 4,943,272

CLASS 494

41 4,943,273

CLASS 501

10 4,943,541
12 4,943,542
96 4,943,543
124 4,943,544

CLASS 502

56 4,943,545
66 4,943,546
150 4,943,547
173 4,943,548
304 4,943,549
327 4,943,550
345 4,943,551
417 4,943,552

CLASS 503

201 4,943,554
227 4,943,555

CLASS 505

1 4,943,556
4,943,557
4,943,558
4,943,559

CLASS 514

11 4,943,560
17 4,943,561
18 4,943,562
23 4,943,563
30 4,943,564
161 4,943,565
179 4,943,566
203 4,943,567
206 4,943,568
210 4,943,569
222.8 4,943,570
232.8 4,943,571
235.2 4,943,572
249 4,943,575
4,943,576
250 4,943,577
252 4,943,578
253 4,943,573
283 4,943,579
303 4,943,580
307 4,943,581
320 4,943,582
338 4,943,574
364 4,943,583
374 4,943,678
380 4,943,584
398 4,943,585
406 4,943,586
415 4,943,587
452 4,943,588
468 4,943,589
469 4,943,590
539 4,943,591
649 4,943,593
722 4,943,595

CLASS 521

79 4,943,594
82 4,943,596
167 4,943,597
184 4,943,598
4,943,599

CLASS 522

106 4,943,600

CLASS 523

220 4,943,603
428 4,943,604
438 4,943,605
457 4,943,606
500 4,943,607

CLASS 524

265 4,943,601
272 4,943,608
314 4,943,609
493 4,943,611
600 4,943,602
714 4,943,612
773 4,943,613

CLASS 525

117 4,943,614
240 4,943,615
264 4,943,616
329.9 4,943,617
340 4,943,618
383 4,943,676
415 4,943,610
463 4,943,619
474 4,943,620

CLASS 526

127 4,943,621
206 4,943,622

CLASSIFICATION OF PATENTS

CLASS 528

272	4,943,623
301	4,943,624
324	4,943,625
353	4,943,682
405	4,943,677
408	4,943,626

CLASS 530

324	4,943,627
326	4,943,628

CLASS 536

117	4,943,629
123	4,943,630
124	4,943,649

CLASS 540

222	4,943,631
225	4,943,632
531	4,943,633

CLASS 544

224	4,943,634
330	4,943,675

CLASS 546

13	4,943,635
294	4,943,636

CLASS 548

260	4,943,637
455	4,943,638
550	4,943,639
551	4,943,640
953	4,943,641

CLASS 549

241	4,943,642
532	4,943,643
533	4,943,644

CLASS 552

309	4,943,645

CLASS 556

1	4,943,646
426	4,943,647
470	4,943,648

CLASS 558

319	4,943,650

CLASS 560

56	4,943,651
60	4,943,652
219	4,943,653
251	4,943,654

CLASS 562

46	4,943,655
90	4,943,656
125	4,943,657
561	4,943,679
572.2	4,943,658
599	4,943,659

CLASS 564

18	4,943,660
26	4,943,661

CLASS 568

66	4,943,662
461	4,943,663
623	4,943,664
633	4,943,665
709	4,943,666
814	4,943,667

CLASS 585

456	4,943,668
471	4,943,553
503	4,943,669
601	4,943,670
642	4,943,671
737	4,943,672
845	4,943,673

CLASS 600

18	4,943,275
29	4,943,276

CLASS 604

2	4,943,274
96	4,943,277
	4,943,278
151	4,943,279
169	4,943,280
192	4,943,281
198	4,943,282
	4,943,283
263	4,943,284
275	4,943,285
408	4,943,287
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558	4,943,286

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45	4,943,290
57	4,942,872
64	4,943,291
70	4,943,292
96	4,943,293
117	4,943,294
131	4,943,295
158	4,943,298
166	4,943,296
200	4,943,297
230	4,942,875

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205	4,943,674

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	320	309,369
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		309,371
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	61	309,373
	101	309,374
D4—	104	309,375
	128	309,376
		309,378
	130	309,377
	138	309,379
D5—	62	309,380
D6—	360	309,381
		309,382
	366	309,383
		309,384
		309,385
	379	309,386
	390	309,422
	394	309,387
	397	309,388
	511	309,389
	571	309,390
	601	309,391
		309,392
		309,393
	611	309,394
D7—	311	309,395
	313	309,396
	354	309,397
	407	309,398
	412	309,399
		309,400
	504	309,365
	507	309,401
	589	309,402
	594	309,403
		309,404
		309,405
	605	309,406
	638	309,407
	693	309,408
D8—	4	309,409
	14	309,410
	17	309,411
	48	309,412
	57	309,413
	93	309,414
		309,415
	104	309,416
	345	309,417
D9—	300	309,418
	305	309,419
	376	309,420
		309,421
	404	309,423
	414	309,424
		309,425
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		309,428
		309,429
	415	309,430
	424	309,431
		309,432
		309,433
	433	309,434
	435	309,435
D10—	2	309,436
	5	309,437
	39	309,438
	46	309,439
	120	309,440
D12—	147	309,441
		309,442
	151	309,443
	203	309,444
	307	309,445
D13—	158	309,447
	162	309,446
D14—	109	309,448
	114	309,449
		309,450
	137	309,451
	163	309,452
		309,453
		309,454
	239	309,455
	253	309,456
D15—	1	309,457
		309,458
	28	309,459
	29	309,460
	89	309,461
	90	309,462
	123	309,463
	133	309,464
		309,466
D16—	107	309,465
	132	309,467
D17—	14	309,468
D18—	2	309,469
	7	309,470
	11	309,471
	99	309,472
D19—	34	309,473
	75	309,474
D21—	62	309,475
	69	309,476
		309,477
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		309,479
	75	309,501
	92	309,480
	108	309,481
	109	309,482
	166	309,483
	191	309,484
	194	309,485
	200	309,486
	214	309,488
	217	309,489
	223	309,490
	238	309,491
D23—	208	309,493
	209	309,487
		309,492
		309,494
	223	309,495
	230	309,496
	366	309,497
D24—	8	309,498
	26	309,499
	51	309,500
D25—	68	309,502
D26—	2	309,503
	68	309,504
D28—	2	309,505
		309,506
	16	309,510
	55	309,507
	78	309,511
D29—	9	309,508
	12	309,509
	16	309,512
D30—	110	309,513
	118	309,514
D32—	35	309,515
	70	309,516
D34—	17	309,517
	40	309,518
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39 : 7,279

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